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OIL & GAS NEWS
The energy industry's journal for the Middle East

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JULY 2020 Vol. 37 No.7 Reg No. 1 OGN 025

FSRU market forecast to double
Xi Nan, Vice-President, Gas and Power Markets Rystad Energy, discusses the state of the market – Page 17

Digital supply during Covid-19
The mass disruption from Covid-19 is accelerating the end-to-end digitalisation of the supply chain transition in oil and gas – Page 19

Chemical industry faces volatility
Covid-19 may accelerate key macro trends, creating a volatile backdrop for chemical firms – Page 20

Fossil fuel: Have we passed demand peak?

BOSTON: Fossil fuel demand may have permanently peaked in 2019 if the global economy does not recover rapidly from the coronavirus pandemic, accelerating the arrival of peak fossil fuel demand by more than a decade, said the Boston Consulting Group (BCG) in a new report.

As the short-term economic fallout of the global Covid-19 pandemic becomes increasingly visible, the crisis may have a significant long-term impact on global energy markets. BCG's article titled "Have We Passed Peak Demand for Fossil Fuels?" explores energy scenarios through 2030.

BCG's analysis of the future energy demand and energy mix for three economic scenarios, representing V-, U-, and L-shaped recoveries, points to a high likelihood that the current crisis will significantly slow world fossil fuel demand over the coming decade. In a scenario combining slower economic recovery with moderate acceleration of the transition from fossil fuels to renewables, as suggested by the "green recovery" measures currently introduced in many countries, demand would never recover beyond 2019 levels.

In such a scenario, the impact would differ by commodity and by region. Coal is the fossil fuel least likely to recover, BCG expects. Meanwhile, demand for natural gas is likely to resume a growth path, and the trajectory for oil will put it somewhere between the other two.

Herhold ... critical turning point for energy

"We may have reached a critical turning point for energy markets. The economic impact of the coronavirus pandemic, decreasingly energy-intensive economic growth, and continued investments in sustainable energy are hitting fossil fuel demand," said Patrick Herhold, a managing director and partner at BCG. "This would fundamentally change the reality for many energy companies much earlier than they expected."

Depending on the recovery scenario, energy companies' margins and capital market standing will come under pressure. They will need to reduce costs and increase resilience against a longer-term environment of low prices, while at the same time accelerating efforts to transform their business portfolios, operations, and investment.

In the fight against climate change, reaching the crest of "peak fossil fuel" demand is no reason for complacency, it says.

Oman displays resilience

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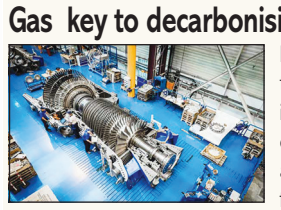
MANAMA: The year 2019 was a bumper period for Oman's oil and gas industry when Petroleum Development Oman (PDO), the sultanate's biggest oil and gas producer, achieved a record production of 1.210 million barrels of oil equivalent per day (boepd), bolstered by a strong uptick in condensate output. This year might be slightly different, a bit challenging to say the least, but the oil and gas sector has it all sorted out.

IN BRIEF

Gas key to decarbonising Mena energy sector



DUBAI: Gas-based power generation is poised to serve a critical role in helping to reduce emissions and complement the growth of renewable energy with highly efficient, flexible, affordable, and reliable baseload power, Joseph Anis, President & CEO of GE Gas Power Middle East, North Africa and South Asia has said.

It is understood that flexible thermal generation, however, will continue to play a critical but changing role, accounting for up to 60 percent of power generated globally through 2028. The most significant trend in global power generation is the projected decline in the use of coal, while gas continues to grow, expecting to account for over one-fifth of total power generated by 2028.

Dubai to explore oil-rich Mozambique

DUBAI: Mozambique is on its way to becoming one of the world's largest energy producers, and its growing oil and gas market is ripe with business opportunities that companies in Dubai can capitalise on, industry experts said during a Dubai Chamber webinar.

Experts identified rising demand for digital solutions and infrastructure, oilfield equipment and logistics services as key areas where Dubai-based companies can cooperate with their Mozambican counterparts and establish joint ventures and long-term partnerships.

Omar Khan, Director of International Offices, Dubai Chamber described Mozambique as a market of strategic importance to Dubai and Dubai Chamber, which offers plenty of exciting business prospects for Dubai-based companies that are looking to expand their presence into Africa.

Mozambique's LNG sector is value at $100 billion.

Oil recovery may gather pace in H2, says Opec chief

ABU DHABI: Oil and gas markets recovery is likely to gather pace in the second half of the year as countries further ease lockdown restrictions and demand rises, said Opec Secretary General Mohammad Sanusi Barkindo, expressing cautious optimism that the worst is over.

The huge and unprecedented oil market imbalance that faced the industry in April in the wake of Covid-19 pandemic required an unparalleled response from producers, said Barkindo, taking part in the online Adipec Energy Dialogues.

Underlining the importance of the two-year agreement, signed by Opec and non-Opec oil producing countries in the Declaration of Cooperation (DoC) on April 12, and revalidated earlier this month on June 6, Barkindo said he was confident that more stability would return to oil markets in the second half of the year, but more work is required to draw down existing oil inventories to help rebalance markets.

"As we see countries begin to open up, we will see demand start to come back," Barkindo said. "I remain optimistic but cautious the worst is over and a recovery will be in full swing in the second half of this year, with stocks beginning to be withdrawn. However, what shape the recovery will take, whether a V shape, W or inverted hockey stick, is still uncertain.

"Nevertheless, I am hopeful by the end of this year we will begin to see some further semblance of stability restored to oil markets. Then we will be in a position to move into the next phase of sustaining that stability. Hence the importance of the two-year duration of the historic agreement signed by the Opec Plus group of countries and non-Opec producers."

Setting out the scale of the "unprecedented demand destruction" suffered by oil markets in April, Barkindo said oil demand had fallen by 20 to 24 million barrels a day, from a high of 100 million barrels per day, as economic and societal lockdowns, in response to the Covid-19 coronavirus, ravaged the global economy. It led to the largest single supply adjustment in history with Opec and non-Opec producers adjusting oil output, including from those outside of the DoC, by almost 20 million barrels a day.

Barkindo ... confident stability will return to oil markets in Q2

INVESTMENTS CRUCIAL

Stressing the criticality to the global economy of restoring stability to oil markets, Barkindo said he had seen projections that forecast a contraction of nearly 20 per cent, or $1.5 trillion, in energy investments as a result of the volatility and uncertainty around markets.

"Investors in all sectors of the economy are allergic to uncertainties. Therefore, it is important we restore stability and sustainability to oil markets, not only for producing countries but also for consuming countries. Both know a lack of investment in energy today will sow the seeds of another energy crisis in the medium to long term. That would not be in the interests of the global economy," Barkindo explained.

Turning to the energy transition and the environment, Barkindo said addressing carbon emissions would remain a central challenge for the oil and gas industry post Covid-19. He urged the global community to address the twin challenge of climate change and energy poverty, and added that all energy sources would be needed to meet global demand for energy in the medium to long term.

"There are over 7.5 billion people in our world. By 2040 the global population will increase by 1.6 billion people. Climate change and energy poverty are two sides of the same coin and only the global community, working together, can tackle this issue," Barkindo said.

The Adipec Energy Dialogue is a series of weekly online thought leadership events created by dmg events, organisers of the annual Abu Dhabi International Exhibition and Conference. Featuring key stakeholders and decision-makers in the oil and gas industry, the dialogues focus on how the industry is evolving and transforming in response to the rapidly changing energy market.

Adipec attracts more than 155,000 energy professionals from 67 countries, including senior decision-makers and energy industry thought leaders, over 2,200 exhibiting companies and 23 national exhibiting pavilions as oil and gas companies convene to share views and best practices to address the long-term impact of the triple challenge of lower oil prices, weaker demand and over supply.

Held under the patronage of His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE and hosted by the Abu Dhabi National Oil Company (Adnoc) and supported by the UAE Ministry of Energy & Industry, the Abu Dhabi Chamber, and the Abu Dhabi Tourism and Culture Authority, Adipec is scheduled to takes place at the Abu Dhabi National Exhibition Centre (Adnec), United Arab Emirates.

Oil firms write down billions in wake of Covid-19

LONDON: Oil majors Royal Dutch Shell and BP have written off billions off their assets value and lowered their oil and gas prices as companies in the sector take a big hit to revenue from an unprecedented collapse in demand due to the Covid-19 pandemic.

Royal Dutch Shell will write $22 billion off the value of its assets after sharply lowering its oil and gas price outlook in the wake of the coronavirus pandemic.

The decision also comes as the Anglo-Dutch company reviews its operations after CEO Ben van Beurden laid out plans in April to reduce greenhouse gas emissions to net zero by 2050.

Shell, which has a market value of $126.5 billion, said in an update ahead of its second-quarter results that it will take an aggregate post-tax impairment charge in the range of $15 to $22 billion in the quarter.

The world's largest fuel retailer said it expects a 40 per cent drop in fuel sales in Q2 from a year earlier to 4 million barrels per day (bpd) due to a sharp fall in consumption due to coronavirus-related travel restrictions.

Upstream oil and gas production is expected to average 2.35 million bpd in the Q2, down from 2.71 million bpd in the previous quarter.

Shell reduced its expected average benchmark Brent crude oil price for 2020 to $35 a barrel, down from $60. For 2021 and 2022 it cut its forecast to $40 and $50 a barrel, respectively, also down from $60. The company also cut its long-term refining profit margin outlook by 30 per cent. Its long-term natural gas price was set at $3 per million British Thermal Units.

Shell's writedown mirrors rival BP's move to take up to $17.5 billion off the value of its assets as it prepares to shift to low-carbon energy.

BP cut its long-term oil and gas price forecasts, betting the Covid-19 crisis will cast a lasting chill on energy demand and accelerate a shift away from fossil fuels.

Shell writes $22 billion off its assets

The move comes as Chief Executive Bernard Looney prepares to outline his strategy in September to "reinvent" BP, including a reduced focus on oil and gas and a larger renewables business.

BP lowered its benchmark Brent oil price forecasts to an average of $55 a barrel until 2050, down by around 30 per cent from previous assumptions of $70. The outlook is the lowest among Europe's top energy companies, according to Barclays research.

BP said that the aftermath of the new coronavirus pandemic would accelerate the transition to a lower-carbon economy, in line with the goals of the 2015 Paris climate agreement.

"We have reset our price outlook to reflect that impact and the likelihood of greater efforts to 'build back better' towards a Paris-consistent world," Looney added.

BP said the new price assumptions will lead to non-cash impairment charges and write-offs in Q2 earnings, due on August 4, in a range of $13 billion to $17.5 billion after tax. It said it would also now review its plans for some oil and gas projects that are at early exploration stages.

PETCHEM SALE

Last month, BP also announced to sell its global petrochemicals business to billionaire Jim Ratcliffe's Ineos for $5 billion, as it achieved its asset sale target of $15 billion a year in advance.

BP said Ineos will pay a deposit of $400 million and another $3.6 billion on completion of the deal, which is expected by the end of the year, while the remaining $1 billion will be paid in tranches in 2021.

Investors have increased pressure on oil companies to adapt their operations to the Paris goals. BP and its European rivals have in recent months outlined plans to sharply reduce their emissions by 2050, although how exactly they will get there remains unclear.

Bruce Duguid, director in the stewardship team Federated Hermes, which led talks between investors and BP over its climate strategy, welcomed the company's accelerated shift away from fossil fuels.

BP said the impairments would include $8-$10 billion worth of write-offs in the company's early-stage oil and gas exploration, covering projects that the company has now decided to axe. Its overall early-stage projects were worth $14.2 billion at the end of March.

BP will write down another $8-$11 billion of the value of so-called property, plant & equipment (PP&E), or producing assets, which totalled $130 billion.

BP is set to increasingly shift its fossil fuel production from oil to natural gas, which is expected to play a key role in supplying growing demand for electricity. However, in its new outlook, the company revised down its assumption for gas from Henry Hub in the United States by 31 per cent to $2.90 per million British thermal units.

It also increased the assumed price it will have to pay governments for carbon dioxide emitted from its oil and gas activities to $100 per tonne of CO2 in 2030, from $40.

The large impairment relates will lower BP's asset value by around 10 per cent, pushing the ratio of equity to debt, known as gearing, to about 48 per cent in the second quarter, RBC Capital Markets said in a note.

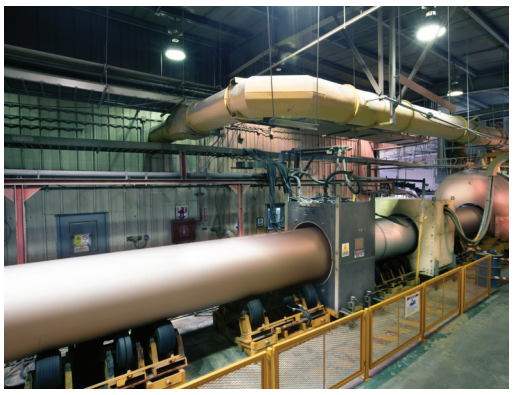
At such levels, the company will need to lower its dividend, the bank said.

Comprehensive Corrosion Protection Coating for Pipelines

Al-Qahtani Pipe Coating Industries

Al-Qahtani Pipe Coating Industries (AQPCI) has been known as a proven leader and a trendsetter in the industry since 1954 as the Kingdom has witnessed major developments in pipeline industry. AQPCI have been a synonymous for Corrosion Protection Coatings for cross country and subsea pipelines for Oil, Gas and Water in Middle East and Global Markets. AQPCI have always been playing a leadership role since the oldest technology of coat and wrap were in use till the Latest Technological Advancements available these days. AQPCI offers a comprehensive Range of Corrosion Protection Coatings with Biggest production capacities in the Region.

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OPAL wants to be a powerful voice
Abdulrahman Al-Yahyaei says the Society's mission is to promote synergies among members, create value and capacity building – Page 9

Reducing welding failures
Adnan Al-Awwami identifies primary sources that influence welding to help achieve optimum quality and reduce welding risks – Page 13

Intertec delivers off-grid solution
A solar-powered hybrid cooling keeps the field shelter cool in temperatures of 55 deg C even with the nearest town 50 km away – Page 16

Inside

Oman Review 2020

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OMAN IS RESILIENT IN FACE OF CHALLENGES

Despite the Covid-19 pandemic blunting progress in 2020, Oman's oil and gas sector has made major headway in oil recovery, downstream investments and renewables indicating a strong bounceback from the crisis

The Nimr water treatment plant processes over 110,000 cu m per day of produced water from the Nimr oilfields in the southern Oman desert

THE year 2019 was a bumper period for Oman's oil and gas industry when Petroleum Development Oman (PDO), the sultanate's biggest oil and gas producer, achieved a record production of 1.210 million barrels of oil equivalent per day (boepd), bolstered by a strong uptick in condensate output.

PDO reported the highest black oil production since 2005, averaging 616,380 barrels per day (bpd) compared to 610,170 bpd in 2018. Its 2019 production of gas averaged 62.2 million cu m per day, which was slightly lower from the 2018 average of 64.8 million cu m per day. However, condensate output rose by 44 per cent year-on-year, surging to 94,000 barrels per day (bpd), up from around 65,300 bpd in 2018.

According to National Centre for Statistics and Information (NCSI), Oman's total oil production, including condensates, stood at 124.1 million barrels until the end of April 2020. Of this, crude oil production was up by 3.4 per cent at 106.19 million barrels while condensates production rose by 30.3 per cent to touch 17.9 million barrels, an *Oman News Agency* reported.

The Sultanate recorded a daily average crude oil production of 1.025 million barrels at the end of April 2020, against 970,500 barrels over the same period of 2019, the NCSI added.

Meanwhile, Oman's natural gas production and imports rose 1.3 per cent to 14.756 billion cu m at the end of April 2020, from 14.564 billion cu m for the same period of 2019. Of this, non-associated gas and imports rose by 2 per cent to 12.132 billion cu m and associated gas production fell 1.6 per cent to 2.624 billion cu m, the NCSI report said.

The industrial consumption of natural gas fell by 16.4 per cent to reach 47 million cu m at the end of April, against 57 million cu m in 2019. As much as 3.545 billion cu ms of natural gas was used in oil fields, against 2.971 billion cu m during the same period in 2019.

All in all, things turned out very well for Oman. However, 2020 might be slightly different, a bit challenging to say the least.

Oil and gas remains crucial to the Sultanate's economy with revenues from the hydrocarbons sector account for about 80 per cent of the national budget. But with plummeting oil prices and the devastating business impact of the Covid-19 pandemic, the country is looking hard to find ways to balance the deficit, including cutting spending and possible financial aid from other Gulf states. Oman's budget deficit is forecast to swell to 17 per cent of gross domestic product in 2020.

In the long run, Oman aims to diversify its economy away from its dependence on oil and gas exports, and open the country up to private sector investment under its Vision 2040. It even foster ambitions of lifting the renewable energy mix by 10 per cent.

Oman is the largest oil and natural gas producer in the Middle East outside the Organisation of the Petroleum Exporting Countries (Opec) with a maximum production capacity of 1 million barrels per day (bpd). In April this year, it announced to cut its May to July production by 23 per cent, or 201,000 bpd, as part of an agreement by Opec and its allies (Opec+).

But the country isn't pleased with Opec+'s monthly adjustment production schedule and especially not during the current global crises, as it undermines market stability, Oman's Oil Minister Mohammed Al-Rumhy has told S&P Global Platts. He said they would continue the cuts until December 31.

Oman is making efforts to sustain oil and gas production and increase hydrocarbons reserves. Last year, Al-Rumhy announced investments of between $10-$15 billion over the next three years, mostly concentrated in the petrochemical industries.

State-owned PDO said it would ramp up production to 700,000 bpd by 2024, buoyed by the completion of its largest enhanced oil recovery (EOR) project at Rabab Harweel.

The Rabab Harweel Integrated Project

(RHIP) represents the largest reserve addition (more than 500 million boepd) in PDO's history and will deliver 76,000 bpd of crude once it reaches plateau. This world-class, highly technical and complex project was delivered two months ahead of schedule and over $1 billion under budget.

In 2019, PDO reduced the unit finding cost (UFC) of oil to $0.9 per barrel of oil equivalent. The company was also successful in booking 136 million barrels of contingent oil resources, and 1.1 trillion cu ft of commercial contingent resource of non-associated gas volumes in some of the most testing terrain in the world.

The firm expects another key EOR project to contribute to its 2024 crude output target. The Yibal Khuff project is set to come on stream in February 2021, although it was initially scheduled to be finished in 2019. Yibal Khuff will deliver 5 million cu m per day of gas and around 10,000 bpd of crude.

PDO said it expects 25pc of its production to come from EOR projects by 2025, but with oil prices down by more than a third since the start of the year, this plan could change.

Furthermore, PDO drilled 26 wells in 2019. The production from exploration wells was approximately 1,250 barrels per day, with further output expected from new exploration wells coming on stream during 2020.

Early this year, PDO drilled the 1,000th well at Marmul–Rahab–Thuleilat–Qaharir (RTQ) cluster located in South Oman. MM-1000 was part of an accelerated programme to boost production by secondary recovery. Its delivery was doubly impressive as the well was commissioned in merely 16 hours from the rig move.

The Marmul field was first discovered in 1956, and was brought on stream in 1980 when the Main Oil Line was commissioned in South Oman. The cluster currently holds a significant portfolio of hydrocarbon volumes contributing an average of 81,600 barrels per day (bpd).

Around 500 more wells will be drilled in the coming few years in various fields in the cluster through the Marmul Polymer Phase 3 development and denser waterflood in-fill projects that will further boost production and add to the nation's reserves.

Separately, Oman is making progress on the biggest oil-storage facility in the Middle East. The Ras Markaz Crude Oil Park, with an expected storage capacity of 200 million barrels, lies 966 km from the Strait of Hormuz and could provide an alternative for energy traders and exporters eager to avoid the waterway. Leasing the tanks would provide much needed extra revenue for Oman.

Oman Tank Terminal Company (OTTCO) has almost finished constructing eight tanks to store hold 5.7 million barrels of crude for a new refinery near the town of Duqm on the Arabian Sea. It's now pushing ahead with others that could be used by oil companies and traders, according to two people with knowledge of the project. That would eventually increase Duqm's capacity to at least 25 million barrels, according to OTTCO's website.

The UAE port of Fujairah, the region's largest hub with 14 million barrels of commercial crude-storage capacity, is less than 160 km from Hormuz.

The Rabab Harweel Integrated Project is the largest development in PDO's portfolio

In the gas sector, BP Oman plans to produce an additional 500 million cu ft of gas from Oman's Khazzan field, known as Ghazir, by the end of 2020, the state news agency said. Construction of facilities has nearly finished, Al Ojaili added, with 126 of 300 wells drilled.

Investment in the Ghazir project as of the end of the first quarter of the year stood at about $9.3 billion out of a total estimated at $16 billion.

Gas production from Khazzan project is currently up to one billion cu ft (bcf), in addition to around 35,000 barrels per day of gas condensate (light oil), BP Oman Chairman Eng Yousef bin Mohammed Al-Ojaili said

BP Oman is planning to develop its business towards the production of 10.5 trillion cu ft from renewable gas resources at Block 61 (Khazzan and Ghazeer fields).

PETROCHEMICALS

In 2018, under a major integration plan, nine state-owned upstream and downstream companies were merged under a new entity named 'OQ'. In May this year, Oxea and Oman Trading International (OTI) were finally integrated into the new company, following six other firms under the leadership of Oman Oil Company (OOC), Oman Oil Refineries and Petroleum Industries Company (Orpic).

OQ Group CEO Musab Al Mahruqi said the aim with this new company is to develop a unique integrated model for an energy company that delivers sustainability and business excellence. He said there was an ambitious growth plan to double EBITDA in the next 10 years and investing over $28 billion in new projects, in addition to investment in alternative energy, retail, and gas-to-plastics projects.

OQ meanwhile has also announced the commissioning of its signature investment, the Liwa Plastics Industries Complex (LPIC), being set up at an investment of $6.7 billion. The project located within Sohar Port will firmly put the Sultanate on the global petrochemicals map.

LPIC's product portfolio will include linear Low-Density Polyethylene (LLDPE), High-Density Polyethylene (HDPE) and Polypropylene (PP). At full capacity, Liwa Plastics will boost OQ's production of polyethylene (PE) and polypropylene to 1.4 million tonnes. This will be the first time for PE to be produced in Oman.

In addition to maximising value addition to the nation's hydrocarbon wealth, the mega venture will also spawn investments in a wide array of downstream activities.

RENEWABLES

As part of its transition to a full-fledged energy company, PDO is placing a greater emphasis on renewables such as solar and wind. It is also continuing to deploy and trial technologies to improve its energy and water management, and reduce flaring and greenhouse gas emissions, it said.

The announcement comes notwithstanding Oman's decision to liquidate GlassPoint Solar company after the sharp fall in energy prices caused by the global economic slowdown because of the pandemic, Oman news agency said, citing a statement from State General Reserve Fund, which is a key shareholder in the company along with Royal Dutch Shell.

The US-based technology startup is billed as a pioneer in the use of solar energy for steam generation in heavy oil production.

It is a technology partner in the development of PDO's Miraah project, a giant 1,021 MW solar farm currently in an advanced stage of implementation at the Amal field south of the country. At full capacity, it will feature a total of 36 glasshouse modules, covering an area of more than 360 football pitches.

In addition to its partnership with PDO, GlassPoint Solar had also signed a Memorandum of Understanding (MoU) with Occidental Oman in November 2018 for the development of a world-scale solar thermal energy, exceeding 2 gigawatts in capacity, at the Mukhaizna heavy oil field in the Sultanate.

A key milestone for PDO was the start of commercial operations at its landmark 100-MW Amin Photovoltaic Power Plant located near Nimr, approximately 300 km north east of Salalah.

The $94-million facility features 336,000 solar panels covering an area of 4 sq km and produces energy sufficient to power 15,000 homes. It would result in an annual CO2 emission reduction of more than 225,000 tonnes, the equivalent to taking 23,000 cars off the road.

The project is known as one of the world's first utility scale solar projects to have an oil and gas company as the sole buyer of electricity.

Amin independent power project (IPP) is also the first utility scale PV power plant in Oman and has one of world's lowest tariff at the time of award for such a project, which spans 23 years.

The installation was built and commissioned in record time, just under 12 months after signing the engineering, procurement and construction (EPC) contract, providing initial power into PDOs electrical grid in March 2020.

PDO Managing Director Raoul Restucci said the Amin power plant represents an excellent example of Oman's outstanding potential in renewable energy.

"Indeed, we look forward to continuing to make further progress in our plans to gradually increase the utilisation of renewable resources in our activities and are currently in the process of evaluating a number of exciting opportunities including wind power installations in our southern locations."

Additionally, PDO is also implementing several residential power installations and has awarded Belgium-headquartered Tractebel-Engie a one-year feasibility study contract to for deploying a 50 MW capacity wind power project.

Another project includes a domestic solar installation project covering 580 villas with a capacity of 10 KW per villa at its under-construction residential township Ras Al Hamra. The project is at the engineering stage. Furthermore, a 1-MWp ground-mounted solar power project that will power 164 homes at Mina Alfahal is currently at the tendering stage.

In another location 300 km west of Muscat, the 500-MW Ibri II project is being developed as Oman's largest utility-scale PV plant to date. The $400-million IPP project is being developed on a BOO (build, own, operate) basis by a consortium of ACWA Power, Gulf Investment Corporation (GIC) and the Alternative Energy Projects Company (AEPC).

Ibri II is expected to come online in Q2 2021 and will supply clean power to state-owned utility Oman Power and Water Procurement Company (OPWP) under a 15-year contract. It will generate roughly 1,300 GWh annually, which is enough to power an estimated 33,000 homes and offset 340,000 tonnes of carbon dioxide emissions per year.

Sungrow, the global leading inverter solution supplier for renewables, has announced it will supply 1500V SG250HX inverter solutions to the Ibri II project in Oman. The solution features 12 MPPTs with maximum efficiency of 99 per cent and enables flexible block design allowing for up to 6.75 MW blocks. Compatible with bi-facial modules and tracking systems, the solution can significantly maximise ROI for a PV project.

IN-COUNTRY VALUE (ICV)

Building on its contribution to In-Country Value (ICV) development, PDO's strategies helped ensure the local retention of cumulatively around $615 million in contract value last year. It also delivered 11 manufacturing and services facilities in 2019, creating around 200 jobs for locals.

Early this year, the biggest producer of oil and gas in the country signed a $26 million contract with Oman Engineering Procurement & Construction (OmEPC) — a joint partnership between four Omani SMEs, including Value Engineering Centre (VEC), Hamad Engineering Services (HES), Precision Engineering Consultancy (PEC) and Rock International.

Mohammed Al Said, OmEPC Chairman, said: "OmEPC is a result of continuous ICV efforts by PDO to create meaningful employment for Omanis. With this contract, PDO has granted OmEPC an opening not only for employment of Omanis, but also development and growth of local EPC capabilities and capacity beyond the boundaries of PDO's operations."

PDO has played a significant role in the industry's ICV strategy since its launch six years ago, leading 43 out of the 53 opportunities. Currently 28 opportunities have been realised through a wide range of activities including the establishment of Omani factories, workshops and repair facilities offering in-country engineering services, equipment and materials to the oil and gas sector.

In another development, a new industrial city will take shape in Marmul, 800 km from Muscat. The city will help accelerate the development of local manufacturing capabilities while expanding supply chains, and is expected to focus mainly on attracting investments in the oil and gas sector. An MoU in this regards was signed by the Public Establishment for Industrial Estates (Madayn) with PDO.

Restucci celebrating the drilling of the 1,000th well at Marmul–Rahab–Thuleilat–Qaharir (RTQ) cluster

PDO leads sector in digital tech, decarbonisation efforts

The Sultanate's biggest oil and gas producer is leveraging renewables, improving energy efficiency, water management and reducing routine gas flaring well before its commitment to the World Bank target of 2030

IT makes complete sense for oil and gas companies in an environment-cautious world not to lose focus of a future that demands them to become less carbon intensive and more caring for the communities they operate in.

Leading that path for other operators in the region is Petroleum Development Oman (PDO), the largest producer of oil and gas in the Sultanate of Oman. The company has set out an ambitious plan to transition to a fully-fledged energy company with a lower carbon future.

In an exclusive interview, **Raoul Restucci**, the Managing Director of Petroleum Development Oman (PDO) spoke to **Abdulaziz Khattak** of **OGN** to give an overview of the company's progress and future plans, its In-Country Value (ICV) strategy, job creation for and training of Omanis, environmental concerns and other developments.

What were the highlights of PDO's performance in the past year?

We met or exceeded targets across our entire business spectrum, but one of the major highlights was the safe and successful start-up of the company's largest oil and gas project at Rabab Harweel in Southern Oman. This represented a very material reserve addition of more than 500 million barrels of oil equivalent. This world-class, highly technical and complex project was delivered ahead of schedule and over $1 billion under budget.

In 2019, we also achieved our highest oil production since 2005, averaging 616,380 barrels per day, and we confirmed plans and capacity to ramp this up to about 700,000 bpd by 2024, as required.

Another pleasing development has been our progress in commercially delivering services to third parties as we gravitate to leveraging our extensive value chain capabilities and broadening our portfolio by becoming a fully fledged energy company. We matured and executed an exploration and appraisal drilling programme for Phase 1 development drilling project in the Greater Barik area for partners, as well as seismic and other services outside our Concession.

With ongoing concerns around climate change, we continued our gradual transition away with greater leveraging of renewables. This has been accompanied by real momentum around more efficient energy and water management and an intensification of our drive to reduce routine gas flaring well before our commitment to the World Bank target of 2030.

I'm also pleased to say that despite the unprecedented challenges posed by the Covid-19 pandemic and ongoing oil price volatility, our staff have adapted well by leveraging the latest digital technologies to work remotely but efficiently and continue to deliver value for Oman.

What contributions did PDO make to the national economy of Oman during the year?

One of our key strategic priorities is In-Country Value as we strive to support governmental efforts to diversify the economy, provide work for Omani jobseekers and build robust domestic supply chains.

We delivered a record 21,012 job opportunities with our contracting community in both the oil and non-oil sectors in 2019 alone, and have now created more than 83,000 since 2011 when the National Objectives programme was launched.

At the same time, we have maintained our drive to keep more of the wealth of the oil and gas industry in Oman, managing to increase the value retained in country to 46 per cent.

Other good news comes from the Ejaad initiative, which we launched with the Ministry of Oil and Gas and The Research Council, to nurture greater collaboration and alignment between industry and academia. To date, we have awarded eight joint projects to different universities to tackle some of our industry challenges.

Ejaad will play an invaluable role as it coordinates, for example, efforts to create a national strategy for hydrogen as a promising economic engine and builds a shared vision for the industry – integrating local and international ambitions.

What new partnerships/MoUs has PDO formed with key stakeholders to collaborate in various areas?

Restucci ... planning for PDO to be a full-fledged energy company

One particularly exciting joint venture is the "SparkLabs Energy Accelerator" programme which offers funding, co-working space and mentorship to help companies develop products and services for the energy sector.

Here, we have teamed up with Phaze Ventures, Oman's first private venture capital fund, and SparkLabs Global, one of the world's biggest networks of business incubator programmes to nurture innovative Omani SMEs.

The programme also provides access to a global network of entrepreneurs, venture capitalists, angel investors and executives, as well as the opportunity to test the viability of early solutions within the real-world setting of PDO's operations.

PDO looks strong on renewables. What new projects has it initiated in this domain? What stages are those projects in?

Perhaps the most notable in recent weeks has been the delivery of our landmark 100-megawatt (MW) Amin Independent Power Producer (IPP) project located in Southern Oman, which has now begun commercial operations, having been successfully commissioned three months ahead of schedule.

The solar installation, which will provide power for our interior operations, was built and came on stream in record time, just under 12 months after we signed the engineering, procurement and construction (EPC) contract.

This achievement represents an excellent example of Oman's outstanding potential in renewable energy and is another building block in support of our continued transition to a fully fledged energy company and a lower carbon future.

Meanwhile, we will continue to operate our flagship Miraah project at Amal in south Oman, which harnesses solar power to generate steam for thermal enhanced oil recovery. We continue to add more photovoltaic (PV) panels to our head office in Minal Al Fahal in Muscat and solar installations to our Ras Al Hamra project and have identified a number of incremental solar and wind opportunities that will be announced in the coming year.

What are the targets set for these renewable projects? How much of it will be achieved in 2020?

The energy generated by the Amin IPP project is sufficient to power 15,000 homes and could lead to an annual reduction of more than 225,000 tonnes of carbon dioxide (CO2) emissions – the equivalent of taking 23,000 cars off the road.

The Miraah plant will have the capacity to produce 300 megawatts (MW) from 12 blocks from July this year.

Overall, we aspire to produce 30 per cent of our power generation from renewable resources by 2025.

On the drilling and exploration sides, what are some of PDO's developments?

Our Exploration Directorate has had much success with new oil and gas bookings form across our Block 6 concession area. In 2019, a total of 136 million barrels of contingent oil resources were booked, largely in Raba East and Hazar South, along with 1.1 trillion cubic feet (Tcf) of non-associated gas, mainly in the Saih Rawl North West area. We also achieved the lowest unit finding cost for oil in a decade at just $1 per barrel.

The directorate safely drilled 26 wells in Block 6, and production from exploration wells was delivered as planned at a daily average rate of approximately 1,250 barrels, with further production expected from new exploration wells coming on stream this year.

How is PDO executing the national oil and gas strategies for promoting value-added industrialisation in the Sultanate?

We recently signed a major Memorandum of Collaboration with the Public Establishment for Industrial Estates (Madayn) to build an industrial city in the Industrial and Logistics Complex in Marmul in south Oman.

We are looking forward to collaborating with Madayn on this strategic project to accelerate the development of local manufacturing capacity and capability while broadening supply chains that can also proficiently support our activities in South Oman.

Bringing these vital operations closer to our fields will reduce turnaround time and costs, provide efficiency gains and help to improve safety.

We have also worked hard with our partners to establish Omani factories, workshops, repair facilities and contracts offering in-country engineering services, equipment and materials to the oil and gas sector. In 2019, we delivered 11 manufacturing and service facilities, creating 200 jobs for locals. As we work to support the Ministry of Health in combatting the Covid-19 pandemic, we have supported the establishment of local manufacture of masks and hand sanitiser.

What are PDO's achievements on the safety front? Have you set any targets for 2020?

Safety remains an overarching priority, and we have implemented a comprehensive package of company-wide measures to protect and care for our people and their loved ones during the Covid-19 outbreak. We have also supported and shared best practice with our contractor community and are presently accommodating several of their staff for quarantining and medical support purposes in various PDO facilities across our Concession and in Mina Al Fahal.

We established a high-level Coronavirus Response Committee and have adopted new work patterns and methods, such as remote working and extended shift cycles, to limit staff exposure to the virus and control its transmission as much as possible.

Our medical resources were re-prioritised to focus on the disease and those patients potentially impacted and the more serious and urgent medical cases.

The critical importance of social distancing, good personal hygiene, and self-isolation if initial symptoms are detected, and the mandatory wearing of face masks in the work environment has been continually reiterated through our internal and external corporate communications channels, including a dedicated Coronavirus site, and social media platforms.

We have supported the Ministry of Health with the purchase of testing and ultra-sound machines, chemical re-agents, and personal protective equipment, and have produced and distributed to company, contractor, government entities and embassies more than 120,000 litres of sanitiser and much more. We are presently accommodating and supporting more than 100 doctors and nurses in our facilities in Mina Al Fahal to ensure they don't expose their loved ones when combatting the pandemic.

Aside from our huge coronavirus response, we continue to make significant strides on the safety front, concluding 2019 with a record performance.

Our lost time injury frequency per million man-hours worked dropped significantly from 0.15 to 0.10, a 33 per cent fall, while the total recordable case frequency per million man-hours worked also fell from 0.71 to 0.57.

The expansion of our in-house Ihtimam (behavioural safety) and Frontline Safety Leadership (FLS) programmes has been universally welcomed and led to an improvement in communication, leadership and the overall safety culture. At the end of 2019, Ihtimam covered 34 contractors and 17,500 personnel while 2,000

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Onwards to a Brighter Future.

رؤيـــة VISION
2030
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KINGDOM OF SAUDI ARABIA

AHQ

Abdel Hadi Abdullah Al Qahtani & Sons Group of Companies

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- **AL-QAHTANI PIPE COATING INDUSTRIES**
  (Epoxy coating and lining for direct smelting, polyethylene, concrete and dual welding)
- **GROUP FIVE PIPE SAUDI COMPANY**
  (Manufacture of steel pipes with spiral welding for oil and water applications up to 120-inch diameters)
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- **AL-QAHTANI INVESTMENTS CO.**
  (Entry into diversified investments)

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  (Providing the services of transporting goods and transporting the passengers of the employees of others)
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- **SAUDI GULF AIRLINES**
  (The operation of commercial aircraft in accordance with international standards and developed airlines locally and internationally)
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... PDO leads sector in digital tech

Continued from Page 6

were FLS accredited.

PDO is also committed to improving road safety both within our own boundaries and beyond and is regarded as a role model within the industry and across the country, and we invest heavily on initiatives to secure the safety of all road users in and out of our concession area.

Our dedicated Journey Management Control Centre, established in 2016, is helping to manage road exposure to an even greater degree, along with greater compliance, consequence management and coaching across both our staff and contractor vehicle fleet.

It has led to a 97 per cent drop in the average monthly number of violations per vehicle (such as speeding or not wearing seat belts) to less than one, and is now monitoring more than 8,500 vehicles across 247 contracts.

The centre's functionalities have been expanded to include e-journey management for PDO staff with a view to include contractors soon. We are also piloting in-cab cameras to improve fatigue management and a new "guardian" system of checking driver behaviour in high-risk vehicles, as well as mandating contractors to introduce online monitoring and daily violation reporting.

For 2020, we will continue our relentless pursuit of Goal Zero – no harm to our people, environment or assets – and intensify our review of Tier-1 process safety incidents to learn lessons and avoid repeats.

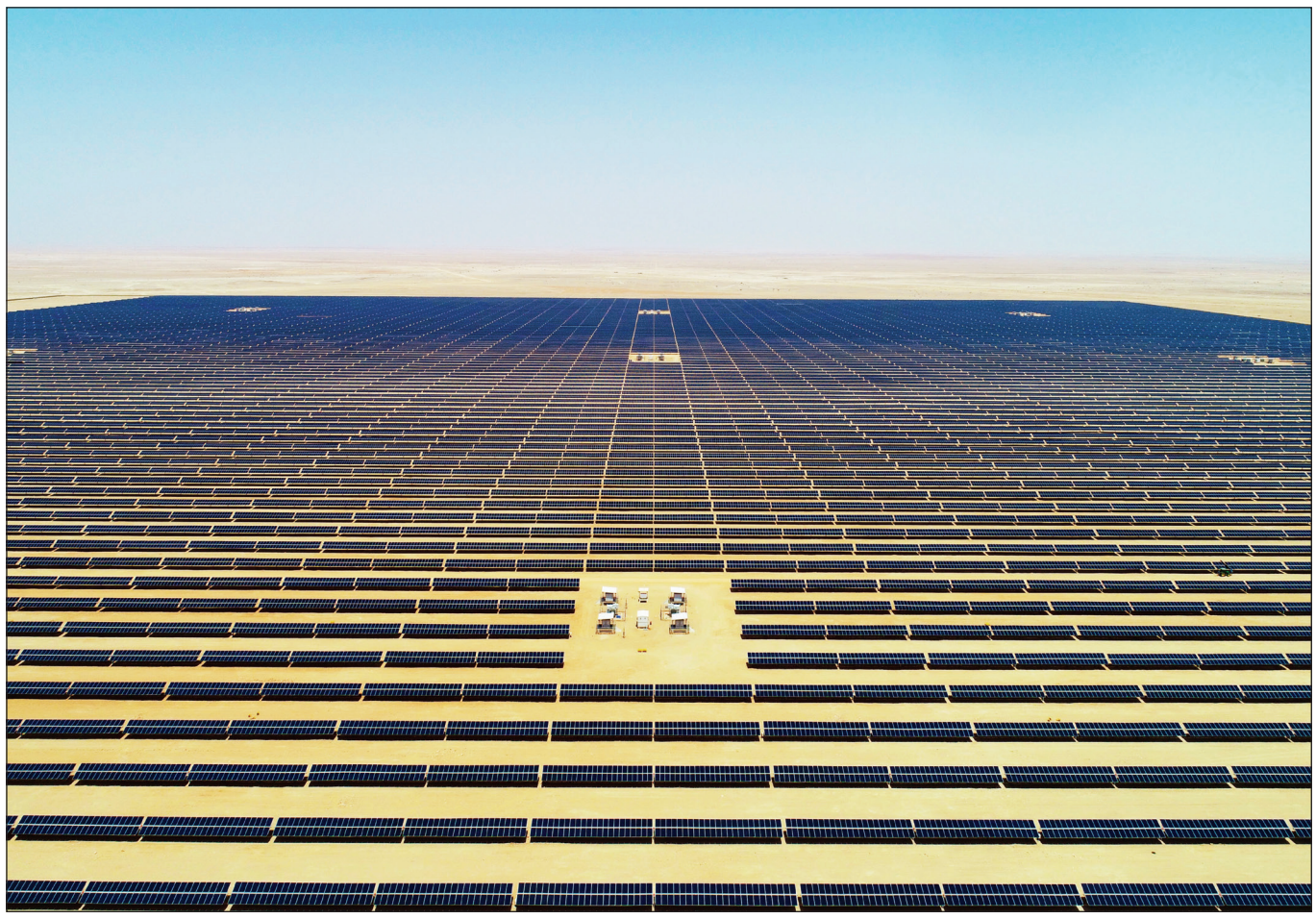
What are PDO's plans to increase the digitalisation of its processes?

With the advent of the Fourth Industrial Revolution, we are increasingly deploying digital systems, automation, artificial intelligence and data analytics alongside lean efficiency tools to eliminate waste, boost productivity and ensure safer, more efficient production.

One significant example is the way we have digitally transformed the management of our wells, reservoirs and facilities through our in-house developed Nibras platform.

This web-based solution is used to integrate all the relevant processes, proactively identify issues by exception and automate workflows; and its deployment, allied to Lean, has resulted in the streamlining of processes and greater performance.

Drone and smart mobility technologies are also gaining greater adoption, reducing HSE exposure in the field and facilitating faster support and intervention between our Muscat headquarters and the field.



The Amin IPP project can power 15,000 homes and annually reduce more than 225,000 tonnes of CO^2

Robotic process automation is increasingly deployed across more and more functions, as indeed advanced analytics to help us in our asset verification through to compressor or sub-surface pump optimisation.

We have launched a remote working programme called Maktabi for our staff and this placed us in a good position to ensure business continuity during the Covid-19 outbreak when our main offices were largely vacated as part of our preventative measures.

We also upgraded our IT infrastructure and increased our bandwidth in a matter of days to bear the additional load of thousands of personnel working from home, and leveraged platforms, such as Skype for Business, for audio and video conferencing and instant messaging.

Over the last few weeks, we have been averaging more than 27,500 virtual engagement sessions per week with team representation varying from 2 to 250 staff at any one time.

Participation in our bi-weekly management townhall live broadcast sessions (Al Hewar) has ranged between 2,400 and 4,300 staff with recording accessed by a further 1,500-2,500 staff. This helps us ensure all are appraised of progress, to address staff enquiries and to ensure we all work as proficiently as possible to deliver on our plans and to best serve the nation and all our shareholders.

Mammoet wins two key contracts for Duqm refinery

MAMMOET, a global leader in engineered heavy lifting and transport, has been awarded two contracts for Duqm oil refinery, a strategic investment for Oman that forms the cornerstone of the Duqm Special Economic Zone.

The development occupies more than 2,000 acres and, when completed, will have the capacity to process approximately 230,000 barrels of crude oil per day. It will produce high-quality products, such as diesel, jet fuel, naphtha and LPG, in compliance with global operational and safety standards.

The first contract came from a local manufacturer, involving the inland and sea transport of nine LPG storage tanks (bullets) for EPC-2 Offsite and Utilities scope of the project.

The second contract was awarded by Agility Global Logistics (Agility) and comprises receiving and transport of various reactors.

Each 780-tonne bullet fabricated at a local fabrication facility in Sohar, measured 72 m long, 11 m high and 8 m wide, and was loaded-out by 44 axle lines of self-propelled modular trailers (SPMT) onto a barge provided by Mammoet in Sohar, bound for the Port of Duqm. Precision positioning of the RoRo ramps, an accurate ballasting plan, expert mooring and sea fastening ensured successful load-outs.

On arrival at the Port of Duqm, the bullets were safely loaded-in, staged in the port's laydown area and transported 25 km to the project site.

The bullets on a barge at the Port of Duqm

Once at the refinery, the bullets were successfully positioned onto their foundations by 1,600-tonne and 1,250-tonne capacity crawler cranes working in tandem. By managing the complete logistics chain from the fabrication yard to the Duqm refinery, Mammoet was able to ensure timely and safe delivery of the bullets.

The Agility contract was an essential component of the Tecnicas Reunidas' Process Unit scope of the project. This included handling a 1,130-tonne reactor measuring 33 m long, 8.7 m wide and 7.3 m high, which was the heaviest cargo ever loaded-in at the Port of Duqm. All the reactors Agility handled have been received successfully and safely delivered to the project site using 54 axle lines of SPMT.

Additionally, 10 hydraulic cranes and three crawler cranes have been engaged at Duqm refinery to support other subcontractors on site.

This is one of the first projects performed since the acquisition of ALE by Mammoet, and has seen colleagues from both former companies combining their expertise to deliver the best possible service.

"We are delighted to have successfully completed our scope for the Duqm refinery. The close collaboration of the entire project team, including our clients, the Port of Duq m and the local authorities, enabled us to successfully deliver all key equipment safely and within the deadlines set," says Vishal Buddhadev, General Manager of Mammoet's Oman branch.

OPAL wants to be a powerful voice for Oman's energy sector

AS the new CEO of the Oman Society for Petroleum Services (OPAL), **Abdulrahman Al-Yahyaei**, has big dreams for the society. Here he speaks to **Abdulaziz Khattak** of ***OGN*** and outlines some key aspects.

In 1998, some people in the oil and gas industry desirous of building local human capital for the oil and gas sector established the Oil Industry Training Board (OITP). The idea was to bring together everyone in the industry and find ways to develop programmes, put systems in place and develop frameworks and standards to prepare Omanis for the oil and gas industry.

OITP's name was later changed to Oman Petroleum Alliance and that's where the word 'OPAL' came from. OPAL was officially registered on October 27, 2001 and called as 'Oman Society for Petroleum Services'. But the OPAL brand name was kept.

So in summary, OPAL is a nonprofit organisation focusing on the energy sector. It is also the only society in Oman to have companies as members rather than individuals, Al-Yahyaei says.

Excerpts from the interview:

What are the vision and mission statements of OPAL?

Our vision is to become the valuable voice of Oman's energy sector and inspire capable and resilient businesses to sustain prosperity. And our mission is to serve our member companies by promoting synergies, added value creation, and capacity building.

How does OPAL help the energy industry and people working in the sector?

OPAL does this through four key focus areas:

- Valuable voice of the industry: Here we conduct research, recommend viable policies to address the challenges facing the sector, and tackle common issues affecting businesses. We also represent member companies in the government and relay their concerns to the authorities.
- Sustainable local content: We promote local content to sustain prosperity of our member companies, energy sector and Oman's economy. We also facilitate the capability development of the Omani workforce at all levels. We do training for development through programmes that are funded by the government, ministries, and even the operating companies.
- Sustainable business practices and common standards for the industry: We promote best practices for HSSE management, quality management, quality products and services, best practices for human capital development and management, and business ethics and code of conduct. For example, we have the annual 'OPAL Best Practice Award' for which our member companies compete in several categories, including operational excellence, HSE, Omani products, and Omanisation. We also run competitions for companies to showcase their projects to the industry.
- Greater synergy across the industry: Here we facilitate sharing valuable information across the sector. As an example, during the ongoing Covid-19 pandemic, we have established an HSE committee, where executives from operating companies get together to address issues related to the pandemic. The committee has established many best practices guidelines, which are shared with all member companies and the industry.

We also promote collaboration and business opportunities among member companies and highlight through various forums. Our plan for 2020 is to conduct 10 local engagement forums for our members and 4 international forums. We managed to conduct three at the beginning of the year, but unfortunately, because of Covid-19, we decided to postpone the other engagements. That's said, we still continue organizing engagements forums through virtual channels with our members though.

What are some of the milestones OPAL has achieved over the years?

I would like to highlight two here: One is promoting best practices for human capital development and management; and the second is promoting best practices for management of QHSE (Quality, Health, Safety and Environment Management).

With regard to QHSE, you would know that there is more than one operating company in Oman and each one with its own standards. And you have to follow these standards to do business with them. This means spending money on training and certifications in these different standards. What OPAL did was to get everyone at the same table and said, let's develop one standard across the board.

By doing so we save money for our contractors and member companies that can work everywhere using a unified standard. So far we have developed six standards, including those for camps, road safety, drugs and alcohol, heat stress, incident sharing, dropping objects, and

Al-Yahyaei ... promoting synergies and creating value

have had operating companies sign them.

These are very comprehensive standards. For instance, in road safety, with the standardised OPAL approved permit, a driver can drive in the concessions and camps of all operating companies.

OPAL has also managed to develop and implement many national occupational standards for the energy sector. For this achievement, late last year we were awarded as the first society ever in Oman to host a Sector Skills Unit, similar to the Sector Skills Council in Europe. This unit will also be responsible to map competencies, job descriptions, develop training and apprenticeship programmes.

We are known to be the organization that facilitates all training for employment opportunities in the industry. Throughout the years, OPAL has trained and developed more than 10,000 Omanis and secured jobs for them.

What are OPAL's strategies for on-the-job training of Omani trainees/employees?

OPAL has been playing a key role in enforcing on-the-job training in all our training and apprenticeship programmes.

The society develops these programmes in-house with the support of subject matter experts from the industry. So our programmes are developed precisely for the industry as per demands.

Which key collaborations/MOUs has OPAL signed recently?

OPAL signed two agreement in the last couple of weeks. One was with the Japanese company Mitsui to enhance the employability of fresh graduates. We signed another with Total to fund Covid-19 tests.

We are also actively working with the Ministries of Oil and Gas, and Manpower to address the issues of the impact of Covid-19 and low oil prices on the Omani workforce.

How much Omanisation has been achieved in Oman's oil and gas sector?

Currently, Omanisation in the oil and gas industry is around 65 per cent, mostly in highly technical fields, which is very good achievement. This varies, of course from company to company. Most oil field services companies have over 80 per cent Omanisation.

However, we are still struggling to fill middle management and technical roles with Omanis because this takes more time, a higher level of education and extensive experience. But it's not something we cannot overcome.

We also have a good number of Omani women in the oil and gas industry. Here at OPAL, our team is 50 per cent women.

We also see Oman women taking up the hard jobs as well, with many are taking up two-week rotation jobs.

What are the challenges in localisation of products and services and what steps are being taken to overcome them?

Some of the challenges include the long time taken by companies to market their products and services; too many manual processes and lack of digital systems; lack of support for SMEs; and strong price competition from imported products or services.

To encourage localisation, companies are bound to allocate 10 per cent of their contract value to SMEs when they are awarded the contracts. This is part the ICV (in-country value) strategy.

The Ministry of Oil and Gas and especially Salim bin Nasser al-Aufi, the Ministry's Undersecretary, is putting a lot of efforts to ensure the industry complies with ICV strategies.

Companies are encouraged to open manufacturing facilities in Oman. An example is Schlumberger's manufacturing facility. This helps in transfer of technology.

As OPAL's new CEO, what is your vision and strategies for the Society?

An area I have been working hard on is to make OPAL a member-centric organisation. Previously, many of our members left OPAL because they did not see any value. But we turned the tables and now have more members. By the end of last year, we had 400 member companies with many more approaching us to become members. Our focus is our members. That's why I came up with the engagement workshops to ensure we don't lose our members.

Additionally, we need to create products and services to retain members, and especially since our members have a diverse spectrum of primary activity serving the industry, including suppliers, accounting firms, medical firms, marine, manufacturing, engineering, drilling and well services, and construction.

To be able to immediately address issues of members, we are establishing a call center and a hotline, and transforming OPAL's website to offer our members more interaction and services online.

To curtail OPAL's losses, I aim to make OPAL self-sustaining. This will be done through products and services offerings.

We also aim to generate revenue through accreditation of training institutes. After auditing these institutes, we rate them according to the OPAL STAR into three main categories: gold, silver or bronze. People in the energy industry and even other sectors are trusting us and rely on institutes that have been recognised by OPAL.

To cut down on spending, we managed to get land from the government for our own building to save us from paying rent. OPAL has renting an office for the last 19 years. The new place we hope will be ready in three to four years.

Additionally, I want to create more HSE standards for the industry. On the standards front, I want OPAL to become the go-to accreditation body to certify your processes. And we have made good progress in the last six months.

How will the current pandemic reshape the oil and gas industry in Oman? What are the lessons learnt?

I think this pandemic will reshape the energy and other industries in many ways. One way is that it's forcing companies to think about digitalisation. Most of the companies in the energy industry are operating entirely from home. This means they are capable to run their businesses from home. In a way, this is Covid-19's positive impact on the industry. Also, we will see the enforcement of business continuity and disaster recovery plan as well as more diversified and transparent supply chain in which they will need to think about localising some of their core business so that they rely less on imports in case of border shutdowns. You have to learn to rely on your own resources. Finally, we will see more requirements for real-time communication vehicles.

What help have you provided to the industry during the pandemic?

Since the beginning of the Covid-19 pandemic, we supported our member companies in organising repatriation flights of their expatriate employees. We collaborated with the respected embassies and the Supreme Committee to organise more than 16 flights so far, to places such as the UK, India, Pakistan, the Philippines, Egypt, Bangladesh, etc. We have raised funds from the industry to conduct Covid-19 tests. We have also created many Covid-19 guidelines. In fact, we have created more guidelines in the last three months than the total number in the last two years.

What are your views on the Sultanate's Vision 2040 with regard to the energy sector?

As enshrined in the Vision 2040, there is a need for rehabilitation of the national workforce in the oil and gas sector by creating high quality job opportunities. This can happen by enforcing the highest local and international standards in the industry.

Also, various work standards and specialised training need to be developed for young Omanis in addition to conducting research on skills required in the sector 5-10 years from today.

A key aspect of the Vision 2040 relevant to the energy sector is renewables. We definitely will not rely on the hydrocarbons for the rest of our lives, so diversification of the energy and energy transition have to be considered.

In fact, OPAL's theme for this year is 'Energy Efficiency'. And we have initiated projects that reflect the theme.

OPAL is aligned with the Vision 2040 in many aspects. Some of our team members are on the Vision review committees.

Drastic cut in lead times with EagleBurgmann KSA facility

Strongly committed to Saudi Arabia's vision of localising manufacturing, EagleBurgmann's facility brings valuable knowhow to the Kingdom, and marks a strategic milestone with its local partner of 17 years, Gas Arabian Services

CUSTOMERS in Saudi Arabia's oil and gas sector can now expect drastic reduction in lead times after EagleBurgmann's new dynamic test and repairing facility for dry gas seals in Khobar went into operation early this year.

Strongly committed to Saudi Arabia's vision of localising manufacturing, EagleBurgmann's facility brings valuable knowhow to the Kingdom. It also marks a strategic milestone with its local partner of 17 years, Gas Arabian Services (GAS).

Aref Al Dabal, Chief Operating Officer, GAS, Saudi Arabia, thanked EagleBurgmann for its commitment to Saudi Arabia, saying more important than financial investment was the transfer of valuable know-how, which many were not willing to share.

"More than 170 years of knowhow of expertise (Freudenberg group) is now coming locally, and that's something you can achieve only with a partner like EagleBurgmann."

In addition to a manufacturing facility, EagleBurgmann has also installed a test rig. According to Dr Andreas Raps, CEO, EagleBurgmann, Germany: "This will enhance local technical skills, and allow flexibility and efficiency for its customers as they are be served rapidly."

Raps presents a memento to Al Dabal (right)

The DGS technology has undergone tremendous transformation since the 1980s. Now you have more safety features, considering that these seals are used in highly critical oil and gas installations especially in terms of pressure and leakage. The new seals are also state-of-the-art when it comes to emission control – Al Dabal

About the test rig, Al Dabal says the dynamic facility serves a dual purpose—servicing the existing population through local repairs, but also manufacturing new DGS and supplying locally.

He continues: "We could have manufactured earlier as well, but for the customer testing is a requirement since you are dealing with high speed, critical machines, and especially for gas, which is more critical than oil due to its high pressure and flammability.

"So from the point of safety of people, equipment and the plant as while, the product has to be top of the class technology."

According to Al Dabal, the DGS technology has undergone tremendous transformation since the 1980s. "Now you have more safety features, considering that these seals are used in highly critical oil and gas installations especially in terms of pressure and leakage. The new seals are also state-of-the-art when it comes to emission control," he says.

EagleBurgmann has been in the industry for over 130 years, and undertakes a lot of research and development to manufacture the DGS, and doesn't only consider functionality, but also the material used to make them.

"EagleBurgmann has always maintained a leading edge in this area, using innovative high technology designs and material, which enables the seal to work in harsh environments and have a long life, says Al Dabal.

FUTURE VISION

EagleBurgmann's commitment to Saudi Arabia in the long-term is evident from its willingness to transfer premium knowledge, says Raps.

This is also in line with Saudi Vision 2030 and the in-Kingdom Total Value Add Program (IKTVA), which the company takes very seriously, he adds.

Commenting on the company's IKTVA efforts, Raps says they are helping customers through localisation (of manufacturing and services).

"We are also helping other local OEMs, such as the compressor manufactures because for them the seal is a pivotal part of their products. So in addition to helping ourselves, we are benefitting the industry as a whole."

Raps sees the Middle East of strategic importance and especially Saudi Arabia. In the last 20 years, EagleBurgmann has created a remarkable track record in the region as it has grown year on year.

About the future of EagleBurgmann in Saudi Arabia, Raps gives one simple answer—growth.

"We want to grow our business and reach the next level of business relationships with our customers and become their preferred partners."

Raps sees an outstanding cultural match between EagleBurgmann's German-based values and the culture here in Saudi Arabia.

"When we look at our long-term relationship in the JV, we see at how remarkably the engineers communicate with each other, and we see diversity in the workplace. And we are very confident that we will have a prosperous business in Saudi Arabia in future."

He says the company had received a lot of positive customer feedback from customers.

When asked about Saudi Arabia's foraying into fracking, Dr Raps says EagleBurgmann is very well prepared for it.

"Fracking for us is nothing new. It started many years ago in the US and in Canada and we have a proven track record, and so we can refer to our existing solutions and modify them for the local needs and requirements. So we are very happy if this is kicking off and we are ready to contribute."

About the business environment in Saudi Arabia, Al Dabal says the Saudi economy depends a great deal on oil and gas. So if there is a fall in international oil prices, you see reduction in capital investment and spending.

An important observation he makes here is the increase in OpEx (operational expenditure) when the customer spends less in terms of CapEx (capital expenditure) reduces.

SUSTAINABILITY

Environmental concerns is heavily focused on in EagleBurgmann's business, which is everything about leakage and reducing leakage.

Dr Raps says they actively support customers in meeting their sustainability targets. "We take the CO2 topic very seriously and help our customers reduce their carbon footprint by using cutting edge innovation developed with our technical capabilities and strong R&D activities."

He says the company recently announced a new innovative DGS seal called the DGS Coba. "We call this the zero emission seal because it reduces methane emissions to almost zero."

Furthermore, Dr Raps they at EagleBurgmann have divided environmental concern into 'handprint' and 'footprint'.

"Footprint is whatever we do in our facilities, where we work with renewables and employ many initiatives to bring down energy consumption, reduce waste, and have sustainable cycles in place," he says.

In addition to a manufacturing facility, EagleBurgmann has also installed a test rig. This will enhance local technical skills, and allow flexibility and efficiency for its customers as they are be served rapidly – Dr Raps

"But of even more importance is the handprint, which include the products sold to the customers. And this is fully in line with the mindset to drive sustainability and to have an impact on carbon intensity."

The globally-operating EagleBurgmann Group employs about 6,000 people. A German-Japanese JV company, the organisational headquarters are in both Germany and Japan. Its parent company is the 170-year-old Fruedenberg Group based in Germany.

EagleBurgmann's global annual sales are to the tune of $900 million.

In Saudi Arabia, the main headquarters is in Khobar, with service centres in Jubail and Yanbu, a sales office in Jeddah and a new sales office opened in Jizan.

EagleBurgmann is strongly committed to employing Saudis to its workforce. The number of local workers now make over 30 per cent of its employees, with a commitment to bring that up to 50 per cent, says Raps.

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PCI develops capability to service diaphram seals of major brands

PCI Instruments, a British manufacturer of high quality process instrumentation and diaphragm seals, works with many companies worldwide, including the Middle East, where it receives free issued transmitters of all major brands to fast-track fit with diaphragm seal systems.

The agility of its operations and consequent speed of service saves money for its customers by significantly reducing down time on their processes. The company also turns around quick repair work for similar assemblies, says Adam Slater, the Sales Administrator.

"We are most proud of building the business up to the point where we now fit diaphragm seal systems to most major brands of transmitters for leading oil and gas companies across the world. We trade with 80 countries at this time," he says

"We always propose a viable solution that is relevant to our customers' requirements for them to consider."

PCI supplies instrumentation to measure pressure, temperature and level. It specialises in diaphragm seal systems and can offer these to cater for almost any application by the use of exotic metals.

Slater says PCI's variety of diaphragm seal systems are designed to be applicable to particular industry and process requirements.

He says PCI's seals are designed with a low fill fluid capacity to minimise errors in measurement and they have a supported diaphragm to reduce the chances of failure and contamination of the process.

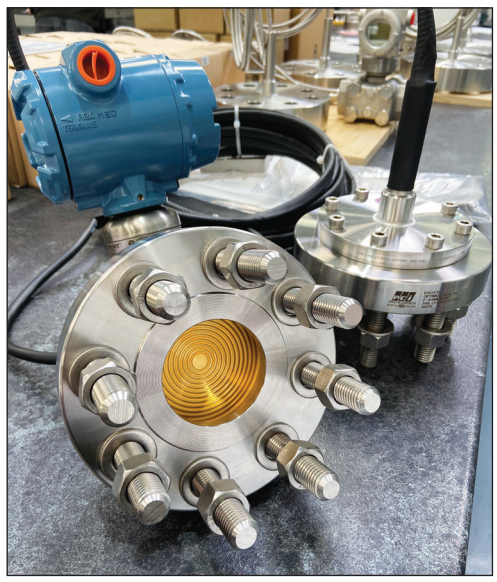
The seal systems are filled under ultra turbo vacuum to extract the maximum amount of air from the system, which itself maximises the accuracy of the instrument reading.

Slater ... presenting viable solutions to customers

Furthermore, Slater says PCI has the ability to weld a single exotic metal diaphragm foil across all wetted parts, not just the sensing part of the diaphragm. He adds this can be done with a host of different metals, from tantalum to zirconium and ensures the weld maintains its integrity under a variety of extreme conditions.

PCI is exponentially growing business year on year and has seen its reach grow across new countries every year of trading. It looks to expand and has significant relationships already in the region. It is currently very active with leading oil and gas companies in the UK's North Sea offshore sector.

Slater says further innovations are leading to increased capability and this will lead to further success for PCI Instruments over the next year and beyond. "We are delighted to continue to service our valued customers in many industries, including in the oil and gas sector."



PCI's gold-plated Optimus XL diaphragm seal, which was supplied direct to a major customer in the off-shore industry

Siemens transmitters free issued to PCI by a leading distributor for the fitting of bespoke diaphragm seal systems

In the past year, PCI has continued to install new machinery in its production facility, in order to expand production further. This was on the back of a move of premises from the year before and which doubled its square footage and production capacity.

This year the company opened a branch in Aberdeen, Scotland to cater specifically for the offshore oil and gas industry in the North Sea.

In conclusion, slater says: "We want to work closely with valued customers and suppliers to help where we can to assist with the recovery of industries from the financial effects of Covid 19. We will also continue our growth across all sectors around the world and with a particular emphasis on oil and gas."

In this exclusive article for *OGN*, welding expert Adnan Al-Awwami identifies the primary sources that influence welding that if exploited can help achieve optimum quality and reduce welding risks

Reducing welding failures can prevent loss of lives, assets

THE hydrocarbon, petrochemical and nuclear industries have had many catastrophic and fatal failures over the years, and the number of new incidents is disturbingly increasing and getting more severe and costly. This is disappointing and pessimistic especially since our industry is not learning from past failures to protect its communities and assets.

Weld failures are taking a good share of the most tragic incidents worldwide. Three of the most famous weld failures include Union Oil Company Refinery in Romeoville, Illinoi, US; Chevron Refinery Fire in Richmond, California, US; and Gas Processing Plant in Antwerp, Belgium.

These three incidents have cost an estimated $1billion (with some pending claims), and killed tens of workers and injuring or medically affecting hundreds others, and taking months to fix and resume operations.

Apart from these incidents, there are countless other unreported weld failures that have caused tremendous loss of asset and human life. The failure to report weld failure incidents will significantly increase the risks and downgrade weld quality.

There are some primary sources that influence welding and which can help achieve optimum quality and reduce welding risks if exploited jointly and smartly:

INDUSTRY WELDING CODES AND STANDARDS

We understand that industry codes and standards dealing with the qualifications of welding procedures and welding personnel enhance to a certain extent weld quality in manufacturing and constructions. However, those codes don't cover all of the essential welding parameters, and if they do, they may not be detailed well.

Piotr Paluszkiewcz, Regional Technical Manager Middle East and Africa of Applus+, highlighted some of the technical weaknesses of ASME Section IX - Welding, Brazing, and Fusing Qualifications in a blog titled "Why following ASME Section IX is not (always) enough".

Being a veteran user of ASME Section IX myself for about 30 years, I have found some shortfalls in the welding requirements. For example, ASME IX does not consider the welding technique (forehand or backhand) in corrosion resistant weld overlay qualification as an essential parameter though the technique affects the corrosion performance of the weld overlay.

An awkward issue about the welding codes is that welding requirements are directly linked to the oil prices. Whenever the oil prices go down, the welding requirements do as well. This justifies why the welding codes write a statement in the scope section claiming they take no responsibility for any undesirable outcome when using the subject code. Therefore, the welding codes do not provide any guarantee of the final weld quality even if we follow them loyally.

Al-Awwami ... focus on preventing loss of life and assets

INDEPENDENT INVESTIGATION ORGANISATIONS

Some countries with large hydrocarbon, petrochemical or nuclear industries have independent investigation and legislative agencies responsible for investigating catastrophic failures. For example, the US Chemical Safety and Hazard Investigation Board (CSB) conducts root cause investigations of chemical accidents, and then issues rules or recommendations for implementations.

Similarly, the Hazards Forum (HF) in the UK is a group of engineering institutions that studies industrial disasters and publishes lessons learned for public awareness of how to mitigate that risk and avoid further potential failures.

Unfortunately, in our region, we do not have any entity with a similar role as CSB or HF to enhance safety and reduce risks in welding. This is why most of the local industrial companies form their own investigation committees after an industrial incident, and they deal with it in the most confidential way. Following the incident, the affected company revises its own specifications and procedures to avoid reoccurrence. However, this does not safeguard other companies in the same country from experiencing a similar failure because of no knowledge sharing.

PUBLIC INFLUENCE

Civil society organisations, and environment or human protection movements have great influence in elevating the safety requirements and by extension the welding requirements too. But we don't have this leverage in our region. The anti-nuclear movement or one of its alliances, for example, organises demonstrations when a company is planning to build a nuclear facility that introduces risks to the people of the environment.

What this does is it forces the company owner to establish sound and thorough engineering specifications to maximise the plant's integrity. The options may be to develop more stringent welding requirements, elevate the weld inspection programme, apply more advance non-destructive testing techniques, etc. This accordingly reduces the chances of weld failures. A point worth highlighting here is that some welding consumables manufacturing companies had to invest huge amounts in improving their products just because of pressure coming from civil society organisations.

WELDING ENGINEERING

It is often thought that a welding engineering role rises only during industrial facility construction because welding is an execution discipline. This is an entirely wrong perception.

The implementation of good welding engineering at all stages of an industrial project (initiation, planning, execution and closure) provides great opportunity to foresee the welding risks and find the solutions.

A welding engineer can engineer the welds based on the project's base materials, design conditions, nature of the service and ease of fabrication and maintenance. For example, some types of welds, namely socket welds, have inherent fabrication problems such as incomplete penetration (IP). Unfortunately, because of the small size of all the socket connections and the awkward welding geometry, it is very difficult to detect this IP defect regardless of how advance the applicable inspection technique was.

That defect, during operations, may develop to a fatigue failure resulting in shutting down the whole plant or causing big damage. Therefore, during the project phase, the welding engineer can develop a special training programme to qualify the welders or specify some welding accessories in order to ensure the soundness of the socket welds. The welding engineer is the caretaker of the deficient conditions that influence the final weld quality.

Being a veteran user of ASME Section IX, I have found some shortfalls in the welding requirements. For example, ASME IX does not consider the welding technique (forehand or backhand) in corrosion resistant weld overlay qualification as an essential parameter though the technique affects the corrosion performance of the weld overlay
– Al-Awwami

Such high number of industrial catastrophic failures should urge us to continue relentlessly to look for welding risk areas and provide solutions. Every welding failure should give us the opportunity to sit together, think, analyse and take corrective actions to prevent similar welding failure elsewhere. Lack of sharing knowledge and overlooking the welding engineering contribution convert our industrial facilities to ticking time bombs that may set off at any moment.

Industry welding codes and standards have been found to have technical weaknesses

• Adnan Al-Awwami is an ex Saudi Aramco and Sadara projects welding engineering consultant. He holds a BS degree in Mechanical Engineering from University of Portland and has more than 30 years of experience in the oil and gas and petrochemicals industries. In January 2015, he established Industrial Solutions Engineering Consultations (ISEC) that specialises in Welding and Materials engineering consultations. Al-Awwami was appointed by the American Welding Society (AWS) as its international consultant in the GCC, and later covering the Middle East.

IGS continues to provide services for mission-critical equipment in Covid-19

Integrated Global Services has continued with its duty of ensuring plant reliability globally with routine responses to emergencies even during this global pandemic

IN THESE unprecedented times, delivering specialised services for mission-critical equipment in the energy sector can be a challenge. To this, IGS said - Challenge Accepted!

"For IGS, it is essential to keep delivering the quality of services that our clients around the world are expecting from us, so they, in turn, can continue to provide critically important services such as power and other energy products to the world economy," says Hayden Hill, COO of Integrated Global Services (IGS).

IGS teams are stationed in multiple strategic locations around the world, enabling speedy mobilisation of crews to the various job sites. International travel can be required to resource the larger projects, such as the projects in the Middle East, where the IGS teams were in the middle of executing when the Covid-19 pandemic went global.

STAYING BACK

When it became obvious that global travel restrictions were imminent, the teams operating on multiple projects in the Middle East in February had to make that all important choice: to continue to execute the projects while risking not being able to get home, or to leave, thus, postponing the work.

The experienced and cohesive teams made the unanimous decision to stay and finish the projects. Upon completing the initial scope, IGS was able to execute additional work between January and March 2020 in both Qatar and Saudi Arabia.

- **Saudi Arabia:** The project involved protecting four process vessels from metal wastage in two plants, from February 12–20 and March 3–6.

  High-Velocity Thermal Spray (HVTS) cladding was applied to a rich amine flash drum, the preheater, the separator, and the stripper column protecting them from any further metal wastage and ensuring the reliability of these vital petrochemical complexes.

  IGS was able to mobilise resources at very short notice and provide a metallurgical upgrade to the base metal of the vessels and columns suffering from severe corrosion damage. Both plants went back in operation ahead of their shutdown schedules.

  Dennis Snijders, Senior Regional Director – Middle East, comments: "A big salute to our crews for working under difficult circumstances, and still delivering the high quality that our customers deserve. IGS goes above and beyond! We continue to serve our customers throughout the Middle East while maintaining the health and safety of our field teams. We have been executing multiple projects in Saudi Arabia and Qatar since early January. We are still continuing to serve our customers in the Middle East to this date, despite the logistics challenges in moving resources in-country and between countries."

  IGS's technicians and project managers are stationed in multiple locations enabling the delivery of project executions with very little notice in these ever-changing circumstances.
- **Japan:** The project involved application of 565 sq m of HVTS in a circulating fluidised bed boiler, from March 23 to April 20.

  Tokyo-based chemical company and the world's fourth-largest silicon manufacturer is operating is No 7 CFB Boiler to provide power and steam for its petrochemical plant. The company has an annual shutdown of the No 7 CFB boiler in March-April, where IGS Japan team, with the help of IGS technicians from the USA and Indonesia, completed the project on schedule, even with extended scope.
- **Indonesia:** The project involved 305 sq m of HVTS cladding applied in Unit 1, from March 23 to May 5. A government-owned electricity provider has been operating its boilers below full capacity. To help increase capacity, IGS applied HVTS in its coal-fired boiler. Despite issues with getting the resources on time due to the global pandemic, the project was completed successfully by the IGS local team in Indonesia with QC support from IGS Japan.
- **Poland:** The scope involved CFB boiler waterwall protection, from May 19-22. IGS mobilised to support a turnaround in a power plant, which is part of Poland's critical power infrastructure. The team made a thorough inspection of the CFB boiler waterwalls and identified high metal wastage areas. These areas were refurbished with the HVTS cladding to prevent leaks of the pressure parts.

  The power plant also asked to protect an additional area, which was subjected to an accelerated metal loss. IGS team managed to execute this further scope promptly, avoiding any delays in the critical path. IGS HVTS cladding stops base material metal loss, making pressure part-exchange and welding obsolete.
- **France:** The project involved extending components' lifetime, from May 26-27. An FCC unit in a refinery had localised pipeline erosion at the elbows and tees. IGS Europe applied HVTS cladding to remedy the problem and extend the lifetime of the fluid catalytic cracking (FCC) column, avoiding replacement and associated downtime and costs.
- **US:** IGS was invited to preserve the life and ensure the reliability of a Copper mine's FS waste heat boiler (WHB) inlet tubes through SO2 corrosion mitigation, and a variety of other areas, from May 25-30.
- **Italy:** The project involved boiler revamp, from May 28 to June 9. A waste-to-energy boiler was suffering fireside corrosion on the waterwall tubes. IGS has applied its HVTS cladding at the top of the 2nd path and the superheater tubes in the same area. This application will significantly extend the lifetime of these critical boiler components', preventing any unforced outages in the future.

Application of HVTS on site

Copper mine optimisation goes to plan in the US

PROJECT MANAGEMENT DURING COVID-19

IGS has produced documentation and carried out extensive training for all its staff aimed at reducing the spread of the Covid-19 virus while working in a safe environment and providing first-class services for their customers. Some of these best practices that continue to enable IGS to deliver projects during this global pandemic include:

- **Travel to and from site:** All staff have been provided with their own face masks to be used while traveling. Best practice on avoiding contact with surfaces, such as using prepay or digital payment methods, has also been shared. Most importantly, frequent hand washing, and sanitizing have been stipulated.
- **Lodging and accommodation:** Staff have been thoroughly briefed on what to expect in hotels, which have now implemented their own procedures and protocols for reducing the spread of the virus. From unnecessary items being removed from rooms, to changes in cleaning services and 'Grab and Go' breakfast arrangements.
- **General precautions:** Daily temperature checks before the shift start have been made mandatory. While IGS is still operating in 12-hour shifts due to the necessary project completion deadlines, the teams will not overlap and all contact between teams will be avoided. Toolbox talks are conducted while maintaining social distancing. Reusable PPE is disinfected prior to the start of each shift.
- **Site safety:** Asset owners have implemented their own control measures, which are to be followed and include: pre-site access quarantine, site access temperature screening, site access questionnaires, Covid-19 awareness training, and new PPE requirements, among others.
- **Symptomatic employees:** Immediate self-isolation is enforced if an employee is showing any signs or symptoms of Covid-19 or if they have been exposed to another person with suspected Covid-19 or its positive diagnosis.
- **Routine responses to emergencies:** Every day, IGS dedicated local teams continue to perform safely and efficiently in these challenging conditions. All while ensuring the reliability of the most critical energy and chemical producers to facilitate the continuity of essential services in these challenging times.

HVTS cladding was applied at vital petrochemical complexes in Saudi Arabia

IGS is an international provider of surface protection solutions headquartered in Virginia, US. It operates operational hubs, subsidiaries, and sales offices around the world to service global asset owners and operators.

IGS has 40 years of experience helping customers solve metal wastage and reliability problems in mission critical equipment and is an industry leader in the development and application of solutions to corrosion and erosion problems in challenging operating environments.

IGS's proprietary High Velocity Thermalspray (HVTS) coating systems solve corrosion and erosion problems in process vessels, towers, columns and other mission critical equipment.

IGS's Cetek ceramic coatings and Hot-tek cleaning, repair, and inspection services optimise the efficiency of high temperature process equipment.

IGS's environmental products improve the reliability and efficiency of critical equipment with unique solid particle filtration and airflow redistribution.

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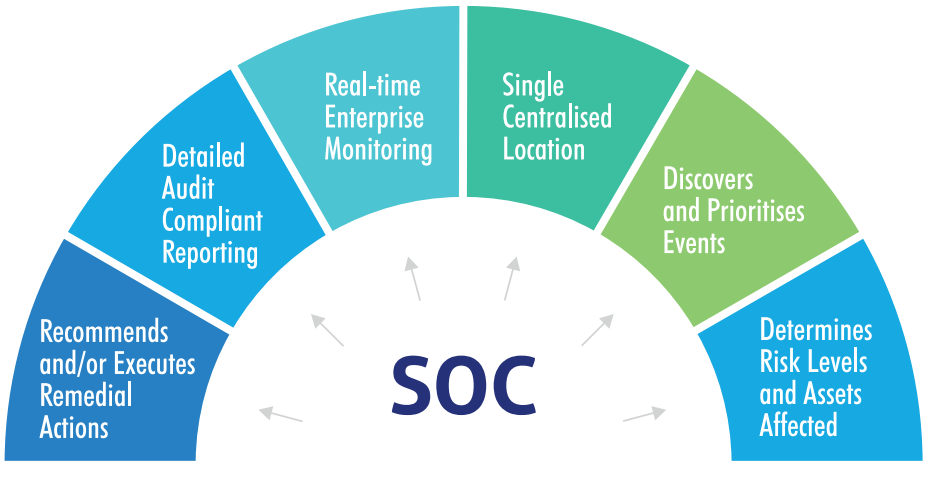

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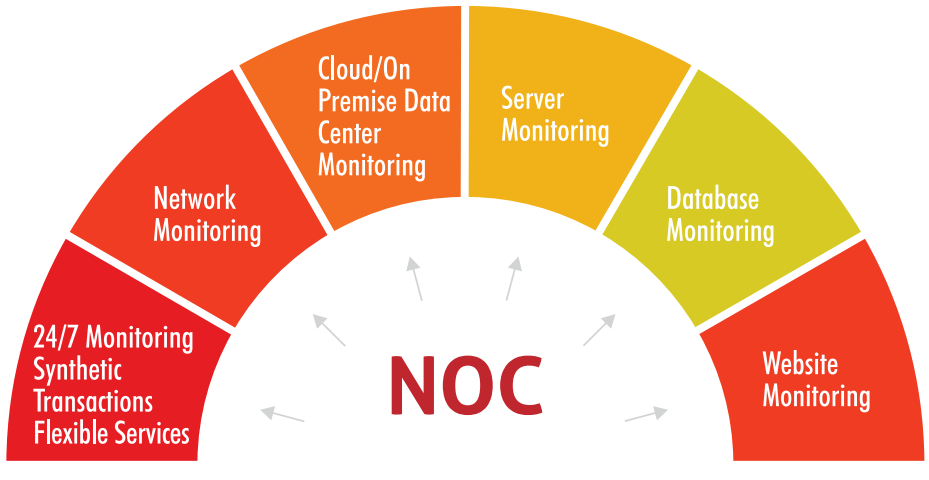

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Field shelter delivers off-grid cooling solution for desert

Intertec's solar-powered hybrid cooling keeps the shelter cool in ambient temperatures of 55 deg C in an off-grid location with the nearest town being 50 km away, says the company

A FIELD equipment shelter fitted with fault-tolerant cooling is ensuring the reliability of a wireless communications link that connects instrumentation on a new gas pipeline crossing a desert in the Middle East to the remote control room.

Fabricated from tough glassfibre-reinforced polyester (GRP) materials, the shelter houses a Tetra base station powered by solar panels allowing it to function reliably in an off-grid location some 50 km from the nearest town.

Intertec's shelter employs a 'hybrid cooling' system to safeguard the 56 sq m shelter's electronics equipment, and battery power storage compartment (a Zone 1 area).

The system consists of a water-based passive cooler assisted by dual-redundant electrically-powered water coolers. This approach combines the intrinsic reliability of passive cooling with active water refrigeration to increase cooling efficiency on hot days.

The system can handle a cooling load of around 1.9 kW, ensuring that even during the region's summers - when temperatures can climb as high as 55 deg C - interior shelter temperatures will always stay below a worst-case peak of around 35 deg C. At other times of the year, internal shelter temperatures are maintained far below these levels.

The remote location means the base station is far from the electricity grid, and must be powered by solar energy. The passive cooling system, based on a water tank with internal and external heat exchangers, exploits the desert climate's daily temperature swing to store the coolness of the night and use it to moderate internal temperatures during the day. The water circulates around the system by natural convection, without electrical power or moving parts.

This system alone manages the shelter's cooling needs during the winter months, typically keeping temperatures at around 18-20 deg C. The two powered water coolers increase the efficiency of the cooling system during the hottest months typically maintaining temperatures in the 20-30 deg C range. Even if both water coolers were to fail, Intertec's passive system has enough cool water capacity to maintain low shelter temperatures for many days, giving maintenance staff plenty of time to access the remote site and make repairs.

The water coolers are a new variant of Intertec's novel Hybricool range that operate directly from a DC power supply, making them an efficient solution for solar-powered installations.

These cooling units are specially designed to supplement passive coolers operating in process plants, with a heat exchanger element that can be installed inside the water storage tank of a passive cooling system to decrease temperature. This interior element is isolated from the rest of the externally-mounted refrigeration system, making it both an efficient and economical solution for explosion proof applications such as the battery compartment of this shelter.

Hybricool water coolers operate on the refrigeration principle. They have a closed loop system with four main components: compressor, condenser, expansion valve and coil. The coil is a heat exchanger element that can be installed inside the water storage tank of a passive cooling system to decrease temperature. The interior and exterior compartments are completely isolated from each other to stop any weather elements from entering the shelter.

Cooling efficiency is aided by the shelter's construction, which uses composite wall panels with GRP sheets 'sandwiching' an embedded 85 mm layer of polyurethane foam insulation. In conjunction with a sunshade, this delivers very stable interior environmental conditions compared with conventional metal-based shelters.

Intertec's manufacturing process allows it to fabricate composite GRP panels with many different material layers. In this application, the outer GRP layers provide exceptional resistance to corrosion, as GRP does not rust or degrade in any meaningful way.

Intertec's hybrid-cooled shelter installed at the Tetra basestation site in the desert

A further gel-coat layer on the exterior surface provides protection against the climate's very high levels of ultraviolet light, and abrasion from dust or sand.

The externally-mounted water coolers additionally feature a centrifugal sediment separator that removes dust and sand, and flaps that close when the cooler is not operational.

A passive cooling system can typically limit the maximum internal temperature of cabinets or walk-in shelters to around 10 deg C above minimum night-time temperatures, making it ideal for applications in arid and desert climates.

The addition of Intertec's Hybricool water cooler technology reduces the dependence on low night-time temperatures, opening up applications in a much broader range of climates and geographical locations.

"Hybrid cooling for field shelters and cabinets is a major enabler for process plant operators that need to install electronics equipment in remote off-grid locations, and hostile environmental conditions," says Intertec's HVAC Project Manager, Simon Marlier.

"The very high level of reliability that can be achieved by hybrid cooling, and its suitability for applications in hazardous areas, can greatly simplify many common remote and unmanned applications. Among the applications potential are wellhead control systems, SCADA stations on pipelines, battery shelters - especially for lead-acid and lithium-ion types - and off-grid mobile base stations."

Intertec has designed and shipped over a million instrument protection enclosures since 1965, to protect equipment operating in the most demanding operating conditions on Earth. It designs and manufactures in Neustadt (Germany), Sarnia (Canada) and Houston (US), with an assembly and system building centre in Russia.

4-Inside the battery room at Intertec's desert shelter

The shelter with its heat exchanger roof, sunshade, during construction at Intertec

Aker Solutions to provide King's Quay umbilicals

AKER Solutions has been contracted by Subsea 7 to deliver umbilicals to the King's Quay company for the latter's development in the deepwater US Gulf of Mexico.

The work scope includes 22 km of dynamic steel-tube umbilicals and distribution equipment to connect the King's Quay floating production system (FPS) to the Samurai, Khaleesi and Mormont deepwater developments.

The King's Quay semisubmersible FPS will be about 280 km south of New Orleans in the Green Canyon area.

The engineering, design, and manufacturing of the umbilicals and distribution equipment will take place at the company's facility in Mobile, Alabama. Work starts immediately and the delivery is planned for 4Q 2021.

In another order, Aker Solutions and Norcem have signed an engineering, procurement and construction (EPC) agreement for delivery of a CO2 capture, liquification and intermediate storage plant at Norcem's cement factory in Brevik, Norway.

The plant is part of the Norwegian carbon capture demonstration project and funded by the Norwegian government.

The 400,000 metric tons of captured CO2 from Norcem Brevik annually will be transported to the Northern Lights project for permanent storage.

Aker Solutions and Norcem continue to work closely on the project to prepare for the EPC phase. The project will use Aker Solutions' Advanced Carbon Capture (ACC) technology and its HSE-friendly S26 amine solvent.

"We are excited to take another important step towards realizing the first industry-scale carbon capture plant at a cement production facility anywhere in the world, and a major EPC project for Aker Solutions," says Knut Nyborg, Executive Vice President, Front End, at Aker Solutions.

"Carbon capture, utilisation and storage will play a big part in cutting European CO2 emissions, and is an important segment in our 20/25/30 strategy."

Aker Solutions will deliver 22 km of dynamic steel-tube umbilicals and distribution equipment

Aker Solutions aims to generate 20 per cent of its revenue from renewables and 25 per cent from low-carbon solutions by 2030.

Xi Nan, Vice-President, Gas and Power Markets Rystad Energy, speaks to the FSRU World Congress team about the state of the market in 2020 and beyond and where we stand now

FSRU market forecast to double, reach 220m tonnes by 2024

THE global supply of LNG will continue to grow in 2020 with 2019 being the sixth consecutive year of LNG supply growth. This rise in global demand has led to the increased commercial viability of Floating Storage Regasification Units (FRSU).

The increased demand also signifies an increase in demand for FSRUs as a less expensive and time-consuming technology as compared to onshore import terminals. FSRUs are a flexible solution with relatively lower capex alternatives and shorter lead times compared to the conventional onshore terminals.

There are currently 42-62 proposed import projects using FSRU facilities, although only 7 of these have signed charter agreements for the vessels. This leaves around 35-55 projects still seeking to secure FSRU vessels, including those yet to reach a final investment decision (FID).

The FSRU market is also in demand to help make natural gas available readily in local markets.

Diversification in the market is highly visible, fulfilling the demands for LNG and natural gas on a global level. In addition, FSRU businesses are also witnessing exponential growth due to the growing demand for green fuel all over the globe.

It is believed the global FSRU market will forecast to reach 220 million tonnes per annum by 2024, a doubling of the 2019 level.

Country	Terminal Name	Start-Up Year	Nameplate Receiving Capacity (MTPA)
25. India	H-Gas LNG Gateway (Jaigarh) - Hoegh Cape Ann	2020	4
26. Brazil	Sergipe LNG Terminal	2020	3.6
27. India	Jafrabad FSRU	2020	5
28. Brazil	Acu Port LNG	2021	5.6
29. Croatia	Krk LNG terminal	2021	1.9
30. Indonesia	Cilamaya - Jawa 1 FSRU	2021	2.4
31. El Salvador	El Salvador FSRU	2021	0.5
32. Cyprus	Cyprus FSRU	2022	0.6

FSRU businessess witnessing exponential growth

At the end of 2019, there were 24 operational FSRUs with a total capacity of 98 million tonnes per annum. Eight plants, with total capacity of 24 million tonnes per annum, were under construction. Those 24 million tonnes per annum under construction are to start up by 2022.

Concerning regions, the established LNG-importing countries in Asia and Europe will be continuing to rely on onshore terminals, but the new, emerging environments in South Asia, Southeast Asia, Middle East and South America will mainly be driven by gas to power needs. In addition Australia is progressing to make LNG imports a reality.

TRENDS

The year 2019 was a major year for new construction on the supply side. The LNG market is expected to stay under loose market conditions by 2024, mainly due to the ramp-up of US and Australian gas.

The ramping-up is also contributing to the current low-level price environment. Rystad Energy forecasts the global energy demand to reach 420 million tonnes by 2024 and 450 million tonnes by 2025.

By comparing what has happened and what has been planned in the past few years we can see that the FSRU market has been moving slower than expected. The current environment, with the low LNG prices, has created expectations of a boom in FID for FSRUs, driven by prospects of the increased affordability of LNG.

However it's a process that takes time to respond. Usually, when the market price is forecast to remain low and it drives more demand for FSRUs, it all takes a bit of time. Rystad Energy still sees a big potential for FSRUs to open new markets for LNG imports. The decline of gas supply in certain regions and power sectors that don't have enough renewable potentials are both drivers for FSRU growth.

Going forward the major additions to the FSRU market are the larger sized ones rather than the smaller scale units. We still see the larger portion of the market is for the larger scale units. In regards to new build or conversions, the new builds are still much more welcome than the conversions.

CHALLENGES AND OPPORTUNITIES

The largest challenge in the industry is presenting a proven business case. Projects need to balance risks around the national legalisation, such as safety, environmental risks and the project's economic return. For smaller scale projects it's harder to do than the larger scale ones.

The opportunities ahead depend at a regional level. In South Asia, Southeast Asia and South America, the need for gas to power fuels demand. In Australia there is an opportunity for these host operators to open up FSRU markets. In Europe there are also potential markets such as in Greece and Germany. But in this current low-price environment we would say there are potential opportunities on a global level, it is just a matter of timing.

Autonomous drone inspections a step closer

Scout Drone Inspection and DNV GL came together to develop an autonomous drone system to overcome the common challenges of tank inspections

A DRONE has successfully inspected a 19.4 m high oil tank on board a floating production, storage and offloading (FPSO) vessel. The video shot by the drone was interpreted in real-time by an algorithm to detect cracks in the structure. It is the latest step in a technology qualification process that could lead to tank inspections becoming safer and more efficient.

Scout Drone Inspection and DNV GL, the quality assurance and risk management company, have been working together to develop an autonomous drone system to overcome the common challenges of tank inspections.

"This latest test showcases the next step in automation, using AI to analyse live video. As class we are always working to take advantage of advances in technology to make our surveys more efficient and safer for surveyors, delivering the same quality while minimising our operational downtime for our customers," says Geir Fuglerud, Director of Offshore Classification at DNV GL – Maritime.

The drone, developed by Scout Drone Inspection, uses LiDAR to navigate inside the tank as GPS-reception is not available in the enclosed space. A LiDAR creates a 3-D map of the tank and all images and video is accurately geotagged with position data.

During the test hosted the test on *Petrojarl Varg*, the drone was controlled by a pilot using the drone's flight assistance functions, but as the technology matures it will be able to navigate more and more autonomously.

"This is another important step towards autonomous drone inspections," says Nicolai Husteli, CEO of Scout Drone Inspection. "Up until now the process has been completely analogue but technology can address the urgent need to make the process more efficient and safer."

The video was livestreamed via Scout Drone Inspection's cloud-system back to Altera Infrastructure's headquarters in Trondheim, where the footage was monitored by engineers.

The Petrojarl Varg FPSO unit inspected using drones (inset)

KIPIC, Honeywell sign deal to optimise services at refinery

Under a five-year contract, Honeywell will deploy Honeywell Forge cybersecurity software and Assurance 360 services to safeguard cybersecurity performance and increase availability and reliability of crude refining and LNG import facilities

HONEYWELL and Kuwait Integrated Petroleum Industries Company (KIPIC) have extended their strategic collaboration, signing a five-year, multi-million dollar contract for services to protect, maintain and optimise operations at the Al Zour refinery and liquefied natural gas import (LNGI) terminal in southern Kuwait.

The contract will see the deployment of Honeywell Forge, an advanced Enterprise Performance Management software platform with robust cybersecurity capabilities that simplify, strengthen and scale industrial cybersecurity operations.

The implementation will bolster network and endpoint security at KIPIC's new 615,000 barrel per day (bpd) crude refining plant and three trillion British thermal unit per day LNG import facility. Honeywell Assurance 360, an outcome-based, performance-focused service management program, will also be implemented at the sites.

"Ensuring the highest levels of cybersecurity and operational excellence remains a top priority for KIPIC," says Hatem Al-Awadi, acting CEO, KIPIC.

"We are building one of the largest integrated refining facilities in the world and selected Honeywell in view of their world-class cybersecurity credentials and expertise in implementing robust lifecycle management plans for critical infrastructure in the energy sector."

To better secure critical operational technology (OT) assets and operations from evolving cybersecurity threats, KIPIC will use Honeywell Forge Cybersecurity Software to safeguard cybersecurity performance and increase the visibility of vulnerabilities, mitigate risks, and improve cybersecurity compliance and management efficiency. This will include the creation of cybersecurity policies and procedures, audits and assessments of enterprise processes and assets, and training programs to help ensure 360-degree cybersecurity protection.

Under the terms of the Assurance 360 service agreement, Honeywell will work with KIPIC to maintain, support and optimise the performance of its facilities while maximizing uptime and reducing operating costs. The multi-year strategic agreement will help ensure automation assets are kept secure and reliable, while providing KIPIC with predictive maintenance and performance insights designed to help meet and exceed production goals and manage total cost of ownership.

Honeywell will safeguard KIPIC facilities

"We are proud to be partnering with KIPIC to increase the reliability, uptime and safety of their operations, and reduce unplanned maintenance incidents," says Rachad Abdallah, President for Honeywell in Kuwait.

"Today marks a new milestone in our journey together, and we are committed to delivering world-class digital technologies and software solutions that will further solidify Kuwait's position as a global leader in the oil and gas industry," he adds.

In 2019, KIPIC selected Honeywell to be the main automation contractor for its Petrochemicals and Refinery Integration Al Zour Project (PRIZe). Under the agreement, Honeywell Process Solutions (HPS) is providing KIPIC with front-end engineering design and advanced process control technology for the complex, which will help KIPIC expedite production start-up and assist in reaching production targets faster and more efficiently.

Also last year, KIPIC selected Honeywell UOP for the reconfiguration of refining and petrochemicals sections of PRIZe to increase the plant's output capacity of fuels and petrochemicals.

Honeywell has been in Kuwait for more than 50 years, and supports the country's energy industry with cutting-edge technologies, efficient business solutions and local training initiatives. The company is the first to build "Made in Kuwait" solutions to power digital transformation across the country's growing oil, gas and petrochemical sectors.

Honeywell is a Fortune 100 technology company that delivers industry-specific solutions that include aerospace products and services; control technologies for buildings and industry; and performance materials globally. Its technologies help aircraft, buildings, manufacturing plants, supply chains, and workers become more connected to make the world smarter, safer, and more sustainable.

Digital service offering proves worth in Covid-19 crisis

Endress+Hauser's Visual Support technology enables audio-visual support for diagnosis and troubleshooting, commissioning and regular maintenance of field devices, says the company

IN ITS drive for digitisation, there couldn't have been a more opportune time for Endress+Hauser than the current extraordinary Covid-19 pandemic to showcase its support programme for remote assistance of personnel.

Due to the pandemic, Endress+Hauser released its Visual Support service application ahead of schedule during the coronavirus crisis, and allowed customers to take advantage of the remote audiovisual support free of charge.

Customers were enthusiastic about the possibilities of this innovation in the Endress+Hauser service portfolio in the product and service area, in customer interaction and in external and internal collaboration.

In the coronavirus crisis, the development of powerful digital platforms and offerings has now proven its worth for customers and the company.

"We can bridge the physical distance forced upon us by the coronavirus through digital and emotional proximity," says Matthias Altendorf, CEO of the Endress+Hauser Group.

This also applies to the service area. Travel restrictions and protective measures due to the coronavirus pandemic have made it impossible to use external service providers in many cases in recent weeks. In order to carry out critical service work related to instrumentation in a timely and appropriate manner, Endress+Hauser has taken the latest innovation in this area, Visual Support, from the pilot project phase to global rollout.

The Endress+Hauser service organisation has been using the possibilities of a cloud-based platform based on the Salesforce customer relationship management system for some time. The Salesforce Service Cloud module enables completely new ways of serving the customer base.

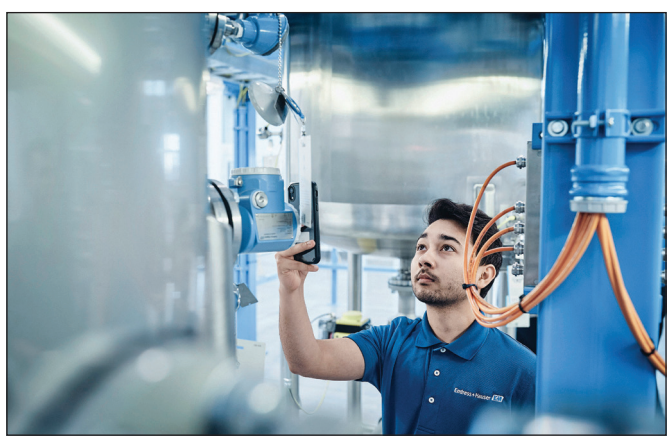
Now Endress+Hauser has integrated Visual Support into its support services portfolio, giving customers access to in-depth technology and product knowledge, including the guaranteed availability and response time from Endress+Hauser's global network of technical experts.

The use of this technology for remote support enables audio-visual support for diagnosis and troubleshooting, commissioning and regular maintenance of field devices. With the help of live video transmission and screen casting, Endress+Hauser's technical support team can work almost as if they were on site, helping customers in a reliable and flexible manner with their service tasks via remote access.

For 10 weeks the service was free of charge for customers. During this time, more than 250 Visual Support sessions were conducted worldwide. "Customers have given us a lot of positive feedback," says Franck Perrin, who heads the Endress+Hauser Group's service organization. "They are enthusiastic about this new form of support and have experienced how Visual Support can save time and money."

Endress+Hauser is a global leader in measurement and automation technology for process and laboratory applications. The family company, headquartered in Reinach, Switzerland, achieved net sales of over €2.6 billion ($2.92 billion) in 2019 with a total workforce of 14,000.

Endress+Hauser's own sales companies in 50 countries as well as representatives in another 70 countries ensure competent support. Additionally, production facilities on five continents manufacture quickly and flexibly to the highest quality standards.



With the help of live video transmission and screen casting, Endress+Hauser's technical support team supports customers in a reliable and flexible manner with their service tasks via remote access

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SABIC Purecares portfolio offers solutions for medical disposables

CONSIDERING the critical challenges faced by the healthcare sector, SABIC has focused on delivering larger volumes of SABIC Purecares polypropylene (PP) materials for manufacturing of nonwovens used in medical disposables such as gowns and masks and hygiene applications.

SABIC's personal hygiene industry team has ramped up efforts over recent months to ensure customers in the hygiene and medical sectors quickly receive much-needed materials to meet urgent and increasing global demands.

Medical disposable gowns and masks are one part of an overall infection-control strategy and they are used as personal protective equipment in health care settings. Nonwovens that are extensively used for these applications, deliver critical properties for the safety of patients and medical staff because of their high levels of efficiency to control sterility.

As a strategic material supplier to the sector, SABIC is supporting its customers by offering a broad SABIC Purecares portfolio of polymers for nonwovens used in making of these products.

SABIC Purecares polymer portfolio including SABIC PP 514M12 melt blown and SABIC PP 511A and 519A spunbond polypropylene materials, offers high purity and excellent breathability, delivering critical properties for the safety of patients and medical staff on prevention and spread of infectious diseases. These materials manufactured with phthalate-free, single-material technology aimed to deliver enhanced properties in spunbond and melt blown fibers for nonwoven fabrics.

SABIC is proud to help its customers meet increasing and challenging demands at this critical time.

SABIC teams are working on a daily basis to ensure business continuity of the full value chain. The company's fast response to its customers in hygiene and medical segments reflects SABIC's ability and agility in answering global customers need.

The additional delivery to customers in Europe and Middle East follows a similar response in China, where SABIC teams sent much-needed additional SABIC Purecares PP materials to support the production of nonwovens used in hygiene and some medical disposable products such as facemasks and protective apparels.

Separately, SABIC is exploring the potential for its Trucircle solutions to be used in nonwoven applications in the near future.

SABIC is a global diversified chemicals company, headquartered in Riyadh, Saudi Arabia. It manufactures on a global scale in the Americas, Europe, Middle East and Asia Pacific, making distinctly different kinds of products: chemicals, commodity and high performance plastics, agri-nutrients and metals.

SABIC supports its customers by identifying and developing opportunities in key end-use applications such as construction, medical devices, packaging, agri-nutrients, electrical and electronics, transportation and clean energy.

SABIC has more than 33,000 employees worldwide and operates in around 50 countries. Fostering innovation and a spirit of ingenuity, SABIC has 12,540 global patent filings, and has significant research resources with innovation hubs in five key geographies – USA, Europe, Middle East, South Asia and North Asia. Its production in 2019 was 72.6 million metric tonnes.

SABIC Purecares PP materials for manufacturing nonwovens are extensively used in medical disposables such as gowns and masks

Dril-Quip, Proserv sign strategic agreement to boost position in subsea market

DRIL-Quip and Proserv Group, a controls technology firm with facilities across the Arabian Peninsula including in Dubai, Abu Dhabi and Dammam, has signed an agreement, according to which the former will rely upon Proserv for the development and manufacturing of its subsea control systems as a supplier.

The arrangement allows Dril-Quip to continue to support its existing subsea controls customers with the support of Proserv. The agreement follows Dril-Quip's strategic decision to consolidate the supply and development of control systems with a dedicated subsea controls provider.

Proserv's independence in the controls area, combined with its versatility to interface with all subsea tree providers made it the natural party for Dril-Quip to partner with.

In addition, the agreement establishes a framework where Proserv and Dril-Quip may pursue joint marketing and collaboration efforts, with Dril-Quip providing subsea trees and Proserv providing subsea controls. This bundled offering will be a compelling value proposition for customers as it brings cutting edge technology solutions at competitive prices.

Blake DeBerry, Dril-Quip's CEO, comments: "We are pleased to announce this strategic collaboration between Dril-Quip and Proserv which allows us to leverage capabilities and enhance our product offerings. Our collaboration will provide significant benefits to our customers in the subsea production system market and allows access to complementary award-winning subsea technologies at competitive pricing."

Proserv will supply subsea controls to Dril-Quip's overall subsea offering

He adds: "This agreement aligns the interests of both companies in leveraging their respective technical and engineering expertise to deliver high quality subsea trees and controls that will save customers time and money, all while enhancing the execution of their offshore projects. We look forward to engaging with Proserv and our customers with these expanded offerings."

Davis Larssen, Proserv Controls CEO, states: "We believe Proserv and Dril-Quip entering this agreement is an exciting and refreshing development for operators and our whole industry as we strive for value solutions focused on best-in-class technologies. While Proserv will continue to operate independently, Proserv will also now support Dril-Quip with the supply of subsea controls to Dril-Quip's overall subsea offering, including fully integrated solutions that provide customers access to best-in-class systems and service.

"At Proserv, our clear focus is the continued development and supply of market leading control systems. Our customers value our focus and we are attentive to their current and future needs as we continue to invest in our technology and build on our reputation for reliability and non-obsolescence, while enabling advanced data management and maximising the benefits offered by digitalisation as we move forward."

David Currie, Proserv Group CEO, states: "Following our restructuring in 2019 and the creation of two focused divisions, this agreement reflects the next logical stage for the Proserv Controls business as it continues to focus on the core strengths of technology and innovative partnering for customer success, as evident here with Dril-Quip, as the only truly independent and focused controls provider in an industry that looks to new solutions going forward."

The Ultramid Advanced N is a suitable material for extruding pre-fabricated components and small assemblies with many applications in the automotive industry, mechanical engineering and kitchen appliances

New BASF advanced PPA made for challenging applications

BASF has developed Ultramid Advanced N5H UN, a polyphthalamide (PPA) that can be manufactured into semi-finished parts by extrusion.

Ultramid Advanced N offers excellent mechanics at elevated temperatures due to its semi-aromatic chemical structure. It shows excellent resistance to chemicals and hydrolysis, even in aggressive environments, as well as good sliding friction properties – and all this at temperatures above 100 deg C.

Due to its low water uptake its mechanical properties remain stable over a wide temperature range. Even in humid environments, the long-chain high-performance material shows a dimensional stability that belongs to the highest of all polyamides.

This property profile makes Ultramid Advanced N the perfect material for extruding pre-fabricated components and small assemblies but also for many applications in the automotive industry, in mechanical engineering and in kitchen appliances. During machining, the behavior of the semi-finished products lies between a polyamide and a polyoxymethylene copolymer, with steady and consistent chip formation and removal.

German plastics company GEHR is using the new PPA to produce extruded stock shapes with a diameter of 50 mm.

"GEHR is the first company to successfully use a PPA for extrusion. With its expertise in extrusion, GEHR has developed stock shapes that can be produced without any voids," says Philipp Wenz, Group Head in Sales of BASF's Performance Materials division.

"We can't say for certain whether it's the world's first semi-finished part made from polyphthalamide. The high-performance material has definitely not yet played an important role in the market for semi-finished parts. One reason for this might be that usual polyphthalamides cannot be extruded very well."

Thus Ultramid Advanced N5H closes a gap in the market between semi-finished parts made of polyetheretherketones and polyarylsulfones on the one hand and semi-finished products made from engineering plastics on the other hand. In comparison to the latter it can be used at continuous operating temperatures well above 120 deg C. The BASF material is also suitable for profiles other than rods.

The first semi-finished part made of Ultramid Advanced N

Bernhard Grosskinsky, Head of Application Technology at GEHR, explains: "BASF's polyphthalamide is far easier to process compared to other PPAs on the market. It gives us a wide processing window with at the same time a high melt stability. The quality of the material always remains the same so that we can maintain a stable production of our semi-finished parts. Last but not least, another advantage of BASF's PPA: It is easy to produce finished components from the semi-finished products by post-processing."

A wide range of applications can be manufactured from GEHR's extruded rods: Components with very high operating temperatures and pump parts requiring exact dimensional stability are just as feasible as gear wheels, thermostat housings and sliding rails. In the automotive industry, the material is particularly suitable for components that come into contact with motor and transmission oils, coolants, acids, salts and de-icing fluids. Parts that require high sliding friction properties can be used even at high temperatures due to the material's high impact resistance and very low wear rate.

BASF's PPA portfolio is based on the four polymers Ultramid Advanced N (PA9T), Ultramid Advanced T1000 (PA6T/6I), Ultramid Advanced T2000 (PA6T/66), and the long-standing Ultramid T KR (PA6T/6). They open the door to the next generation of lightweight, high-performance plastic components in many different sectors including the automotive industry, electronics and electric devices, mechanical engineering and consumer goods.

The PPA portfolio is available globally and complemented by BASF's Ultrasim simulation tool and extensive experience in application development. It includes more than 50 compounded grades for injection molding and extrusion, products with or without flame retardants. The compounds are available in different colors, from colorless to laser-markable black, with short-glass, long-glass or carbon fiber reinforcement, and with various heat stabilizers.

BASF's Performance Materials division encompasses the entire materials' know-how of BASF regarding innovative, customised plastics under one roof. Globally active in four major industry sectors – transportation, construction, industrial applications and consumer goods – the division has a strong portfolio of products and services combined with deep understanding of application-oriented system solutions. In 2019, the Performance Materials division achieved global sales of €6.06 billion ($6.81 billion).

BASF's portfolio is organised into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. In 2019, the company generated sales of €59 billion.

Petrobras orders 4 Saab Seaeye Leopard vehicles

FOUR Saab Seaeye Leopard work vehicles have been ordered by Belov Engenharia for Petrobras operations in Brazil.

"The Leopard was chosen for its compact size to power ratio," says Belov's Director of Operations, André Weber Carneiro.

"We like the quality of Saab Seaeye products and their technical support, which is always available when needed."

No other electric robotic vehicle is comparable to the 3,000 m rated electric Leopard.

Half the size of an equivalent hydraulic work vehicle, it is more agile and responsive, has greater workability and can handle stronger currents - opening up wider operational windows.

Its compact size with unprecedented ratio of thrust to volume and speed through water brings the power, payload and control stability needed to carry the hefty range of tooling and sensors usually associated with much larger hydraulic systems.

This brings considerable savings in footprint, staffing, mobilisation and maintenance cost.

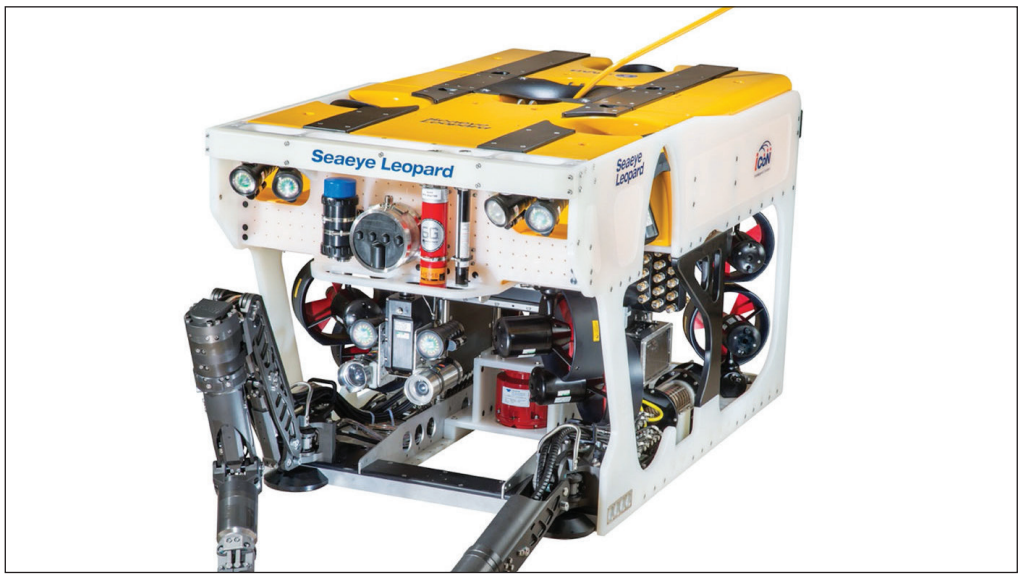
A key benefit in operation of the Leopard, is its iCON intelligent control architecture. Not only does this bring greater control, but offers more information about the vehicle's operation and enhances fault diagnostics along with greater redundancy. iCON is also future-friendly for evolving technologies including autonomous operations.

The Leopards join Belov's Saab Seaeye fleet and will be deployed from three Diver Support Vessels (DSVs) and used for cleaning and inspecting risers on Floating Production Storage and Offloading vessels (FPSOs), amongst other tasks.

Saab Seaeye is world leader in electric underwater robotics - including ROV, AUV, hybrid systems and tooling - and creator of the revolutionary iCON ecosystem.

Belov Engenharia has 30 years' experience in civil, harbour and underwater works together with providing offshore services including ROV operations and hydrographic services.

The Four Leopards will be deployed from Belovís DSV fleet



The Saab Seaeye Leopard is the most powerful electric work vehicle of its size in the world

Game changer: Worley Academy deploys BRIMopoly at Bapco

Using everyday case studies and customized courses, BRIMopoly enriches players' understanding of their roles and responsibilities, behaviours and how to best implement the BRIM philosophy into Bapco

WORLEY Academy has received rave reviews for its BRIMopoly learning game it launched with its customer, Bahrain Petroleum Company (Bapco).

BRIM stands for Bapco Reliability and Integrity Management and in this game, players are looking to enrich their understanding of their roles and responsibilities, behaviours and how to best implement the BRIM philosophy into the Bapco organisation.

Using everyday case studies, players understand the processes related to BRIM, and how these processes are used to drive decision making and cultural change.

Created by Worley Academy, with a vision to accelerate people capability and performance across the full asset lifecycle, the trainers offer unique, experiential and customised courses that are in demand. When the request to deliver BRIM 101 and BRIM 102 training came into the Academy, the instructors put on their creative thinking caps and developed BRIMopoly.

The course is structured around an innovative and highly interactive board game -, which are carefully and dynamically designed to expose game players to all aspects of BRIM.

The necessary knowledge and techniques are introduced as exercises and selected at random by rolling dice to move around the game board.

A briefing card is produced for each scenario. At any intersection, there will be additional resources, such as think cards, to help complete the activity and answer questions.

Taking out the traditional method of PowerPoint training, a classroom course based around a board game such that players are actively engaged from the moment they enter the classroom to the moment they leave, has proven BRIMopoly effective.

BRIMopoly helps to accelerate people capability across the full asset lifecycle

According to Howard Thomas, Principal BRIM Instructor: "Using a game as a method of experiential learning is tried, tested and proven. As part of the facilitator plan, participants roll the dice early in each event, typically within the first half hour to 45-minutes of the training session. By going through the process as a game, the participants learn by doing, which is the primary principle of adult learning."

As players move around the board game, there is an opportunity for every player to do one debrief in the course. The facilitator enhances each debrief to add in any elements that may have been missed. This guarantees that while no two courses are delivered the same, all material is adequately covered in each session.

Further explained by Chris Gilbert, BRIM Co-instructor and Game Designer: "The (board game) approach demonstrates the huge energy and capability of Bapco personnel, exposed through the format of participants having to work hard on a specific well-thought out technical task, and then present it back to the whole team so all learn. Every single person seemed to appreciate this format, which appeared new to Bapco."

Over 450 participants over an 8-week period have rolled the dice, and they have lots of positive feedback to offer.

Plant Maintenance: Really interesting course and applicable to be implemented in day to day routine activities.

Technical Services: BRIMopoly is a great tool to experience the new way to look at reliability management.

Reliability Engineering: The BRIMopoly game made the training session more interactive and easy to understand the BRIM process.

Operational Excellence: The course prompted thinking differently and focused on the core principles that can change the way we do things.

Technical Services: Honest assessment of company situation. Realistic, practical, logical approach.

Operational Excellence: The methodology was practical and applied psychologist knowledge that helps participants to retain concepts. The exercises were real cases that put in perspective the importance of BRIM. Well done!! I really enjoyed the training.

Plant Engineering: Thank you for organizing this training. The game technique was so beneficial to understand the different case studies and scenarios. Very creative and entertaining, rather than a typical lecture!

Process Control Engineering: Wow! What a fantastic course, totally immersive and really helped me gain a better insight into BRIM. 10/10!

According to Worley Academy, the board game training can be customised to specific goals and objectives that best suits the business. Worley Academy also offers an array of training differentiators that will set your team a step ahead of the rest.

Cortec launches layup guide of land-based drilling rigs

WITH the major shocks the oil and gas industry has experienced in recent months, today's rig count is significantly lower than last year. Land-based oil drilling rigs are typically the first to be affected and shut down during market lows, leaving operators in critical need of practical solutions for preservation.

To help rig operators avoid loss from equipment corrosion during extended shutdown, Cortec Corporation has published a detailed guide to 'Layup of Land Based Drilling Rigs'. The guide offers step by step instructions using preservation materials that in many cases do not require extensive removal prior to startup, simplifying preservation and minimizing or eliminating disposal concerns.

The layup guide goes into detail about how to use VpCI Technology to protect mud pumps and boilers, top drives and draw works, different sizes of HPUs and electricals/electronics, and much more. These include diesel engines, roughnecks, hydraulic catwalks, AC traction motors, VFD and MCC Houses, mud pits, water tanks, choke manifolds and gas busters, air compressors, drill pipes, and winches.

Recommended protective materials include Cortec oil additives, VpCI Emitters, VpCI-126 HP UV Shrink Film or MilCorr VpCI Shrink Film, VpCI-649, and VpCI-337.

CorrLube VpCI Lithium EP Grease serves as an all-purpose corrosion inhibiting lubricant for the many grease purge points found on equipment, while CorShield VpCI-369 is a versatile wet-film corrosion inhibitor that can be used on a variety of connectors or moving components.

One common strategy outlined in Cortec's land rig layup guide is to spray ElectriCorr VpCI-239 inside electrical/electronic enclosures and apply VpCI-105 Emitters, VpCI-111 Emitters, or VpCI-308 Pouches according to the space's volume. These materials are useful for protecting the many sensitive and critical components such as computers, touch screen HMIs, battery packs, and AC drives found on a drilling rig. Products are extremely easy to remove at startup, if they need to be removed at all, and some may continue to be used for corrosion protection during operation.

For the pervasive lube, oil, and gear systems of drill rig equipment, the guide repeatedly references Cortec's range of corrosion inhibiting additives for compatibility with different oil types: PAG, PAO, or mineral-oil based. These additives play an important role in effective preservation for hidden but critical systems and can be easily removed if required. Other corrosion-inhibiting additives, coatings, or injectable products listed in the guide address the needs of cooling systems, fuel systems, and both insulated and non-insulated piping on a drilling rig.

For anyone who finds themselves in a time of crisis in the oil and gas industry, wondering what to do next and how to protect assets in the meantime, this guide will be an important tool to successful asset value preservation amidst uncertainty.

Cortec's guide will help rig operators avoid loss from equipment corrosion during extended shutdown

Cortec Corporation is the global leader in innovative, environmentally responsible VpCI and MCI corrosion control technologies for the packaging, metalworking, construction, electronics, water treatment, oil and gas, and other industries. Headquartered in St Paul, Minnesota, Cortec manufactures over 400 products distributed worldwide, and is ISO 9001, ISO 14001:2004, and ISO 17025 certified.

The mass disruption from Covid-19 is accelerating the end-to-end digitalisation of the supply chain transition, write John Bolto, General Manager for AdditiveNow, Worley and James Donegan, Director of Business Development for Requis, Worley

Trialing digital supply chain tech on the fly during Covid-19

WHAT happens when you urgently need a two and a quarter tonne, 1.6 m diameter blind or a high specification ball valve for your oil and gas operation in the middle of a global pandemic?

Your usual Italian valve manufacturer went into lockdown several weeks ago and your usual Chinese pipe fitting manufacturer has only just returned to work with a backlog a mile long; nowhere has such heavy and expensive items 'on the shelf'.

Had this situation arisen even just a couple of years ago, you might have been stuck for a solution, yet the rapid digitalisation of supply chain management has created new ways of working, just in time.

Covid-19 has highlighted the weaknesses in many oil and gas operators' procurement processes: diversification. Seeking economies of scale, it is not uncommon to find operators sourcing as much as 70 per cent to 80 per cent of their supply from just three or four companies. This has now left many operators in a pinch, unable to source what they need, and not necessarily having the right processes and certifications in place to source elsewhere.

Importing something from abroad? You're in for a long wait. The rapid decline in travelling abroad has had a knock-on impact on airfreight. With over 40 per cent of air freight carried in passenger jets, and reductions on commercial air traffic exceeding 60 per cent in some regions, this mode of logistics is under significant stress.

While many airlines have scrambled to offer commercial freight services to replace consumer carriage, the whole process is still being ironed out. Shipping lanes remain active, yet the virus has impacted docks and landside logistics. Typically, a shipment from China to the Middle East might take four weeks, right now you'd be lucky to receive it in eight.

Even overland shipments have struggled. At one point, deliveries from the eastern states of Australia to Western Australia were taking two to three weeks, instead of the usual two to three days. Everything is running much more slowly than usual.

Donegan and Bolto ... digitalisation focus

PUTTING THE PIECES BACK TOGETHER

In the case of our valve, you could be waiting longer still. However, long that manufacturing site is in lockdown for, it will likely take just as long for it to get back up and running – reemploying, regrouping the supply chain and stabilising stock levels will all take time. So, for a large, high specification valve, we could be looking at months, if not a year or more in stock disruption.

If that product is not already on a shelf somewhere, you need to begin to diversify. Looking closer to home is a good start. What kind of manufacturing capabilities and raw materials options do you have locally that would allow you to make the rest of the supply chain work in the time that you have available?

You may also be contending with a run on prices. With the instability of the oil market, and shut-ins looming, many operators will see it as an opportunity to take on large maintenance projects that had been scheduled for later in the year.

If they do not have that part to hand, they will soon be looking to source it. And, all the usual requirements for safe operation still apply. Plants need parts. But that's not to say that they are not available, simply that the procurement processes many operators follow do not give them enough visibility to assess and access other options.

OUT WITH THE OLD

Many operators continue to rely on their tried and tested ERP system: Functional, yet often siloed and closed source, ERP systems leave no real room for improvement. Operators lose out on all the visibility that comes with adopting an end-to-end supply chain solution that can integrate with third party platforms, and it also typically lacks the same level of trust that digital solutions now build in as standard.

A digital twin of the procurement process is one innovation that can help companies gain better visibility over the weak spots in their supply. It can highlight a breakdown or bottleneck in the supply chain early on and incentivise procurement teams to reallocate resources or find alternatives. Having used digital twins to improve asset management, health, safety and performance, it is a concept that the industry knows works.

Yet, right now the disruption is so extensive that most companies will need to do a lot more than a real-time review. To maintain safety and uptime in the long-term, most operators will need to think about how to source the critical parts that could cause major outages and put in place thorough supply chain risk mitigation measures.

TRIALING NEW PIECES FOR SIZE

The solution does not need to be to physically hold parts in stock. As an example, operators could roll out an asset performance management system on the most high-risk equipment to provide better early warning signals.

It could be that the engineering team works with a bespoke 3D printing provider or a local advanced manufacturing facility to understand the timeline for manufacturing the parts locally instead. Or it could even be that the operator turns to those around it, to understand what inventory might be available locally through an e-commerce platform.

Going back to the valve and blind example, it was a couple of digital supply chain solutions that Worley combined and executed concurrently to solve the challenge.

The team at AdditiveNow, Worley's bespoke 3D metal printing and advanced manufacturing joint venture, set about designing a custom solution for the blind that would meet the specification and quality requirement in the timeframe available. Leaning on their background and expertise in oil and gas, the team were able to swiftly prepare a potential agile manufacturing solution.

In the meantime, a second team from Requis, Worley's enterprise supply chain and commerce platform, accessed over one million asset listings from operators selling surplus equipment they no longer needed. The team was successful in finding the valve and handled the procurement including vetting the supplier and delivery to site.

The seller of the valve was pleased too. As the industry turns to cost savings to weather market instability, many see the benefit in turning surplus and used assets into cash. Digital supply chain solutions make this far more time efficient while maximising value by connecting the right people together.

A COMPLETE PICTURE

The end-to-end digitalisation of the supply chain has been on the oil and gas industry's horizon for some time, but for many operators, the mass disruption from Covid-19 is accelerating the transition. Nothing dismantles resistance to change quite like the need for survival.

While there is a lot of fallout, the disruption is also helping to crystallise priorities and get decisions made. For supply chain procurement, there really is no better time to be trialing digital techniques that will create much needed agility and diversity.

Many supply chains will remain fragile for quite some time, and trust will need to be rebuilt. But with digitalisation, much of that trust will be built in from the start, whether that's through complete visibility of the asset's document history, or knowing your local 3D printer and advanced manufacturers who have the industry expertise, should you need a new part at short notice.

• *Worley is a global engineering company providing project delivery and consulting services to the oil and gas sector.*

Expertise undertakes biggest repatriation effort

More than 2,000 employees stranded in Saudi Arabia due to the Covid-19 pandemic are being sent home in 12 charter flights, fully paid for by the company

EXPERTISE Contracting Company has initiated the biggest repatriation mission ever undertaken by any private company in the entire Middle East and the Kingdom of Saudi Arabia (KSA).

The company has started repatriation of more than 2,000 employees in the first phase on 12 charter flights to a number of South Asian countries after getting approval and permission from authorities in KSA. These include nine flights to India, two to Nepal and one to Pakistan. More flights will follow.

Commenting on the repatriation missions, Fares Al Shammari, President of Expertise Contracting Company, said: "Our aim is to provide much-needed relief to our employees in this overwhelming global pandemic. After a close follow-up with various officials for more than 30 days, we were finally successful last week to get the permission to book special charter flights."

It is worth noting that Expertise Contracting Company has decided to bear the costs of the repatriated workers' airfare and their quarantine period in their countries in line with its commitment to supporting its people in times of dire need.

Al Shammari said the company's crisis management team was working tirelessly to ensure the formalities of all 2,000 employees are being taken care of for their flights, which start tomorrow.

He said: "This is the first successful phase of repatriating employees back home, and we are relieved to see smiles on the faces of our people. We are already in the process of arranging more charter flights to accommodate more employees."

Based in Jubail Industrial City, the 20-year-old Expertise Contracting Company has more than 10,000 employees and their families living in KSA.

Giving his views on the pandemic situation, Al Shammari said the Covid-19 pandemic had impacted everyone, some more drastically than others, adding that finding the new normal could be challenging, as schools, offices, worksites and other places of interest remained closed and an end to the situation still unknown.

"Earning your daily bread has been the biggest factor affected during this pandemic, making it worse for people who have left their families and come to work in foreign countries with a dream of supporting their families back home," Al Shammari said.

He said during the pandemic, countries around the world had shut their borders no one was allowed to enter or leave. The airlines had been in a lockdown for more than two months during which the situation of our Indian employees was quite stressful to handle.

"During this period, Expertise Contracting Company was desperately looking for solutions to help repatriate critical employees to their home countries. These included pregnant women, children, employees of over 50 years of age, and those requiring medical attention," he added.

He said all concerned authorities in Saudi Arabia, India, Pakistan and Nepal had lent great support to facilitate the repatriation mission.

On his part, Mohammad Ashif, CEO of Expertise, said: "We appreciate the efforts put in by every person and organisation to make this mission happen."

He added: "The officials and employees at Expertise express their deepest gratitude to the government of Saudi Arabia and the Indian Embassy in Riyadh for their timely support."

The company officials have wished their repatriated employees a safe stay in their home countries and look forward to having them back to Saudi Arabia in a few months to resume their work.

Oil, gas after Covid-19: New age of opportunity?

Leading companies will use the crisis to redefine their reasons for being and their basis for distinctiveness, write McKinsey experts Filipe Barbosa, Scott Nyquist, Kassia Yanosek, Giorgio Bresciani and Pat Graham

THE oil and gas industry is experiencing its third price collapse in 12 years. After the first two shocks, the industry rebounded, and business as usual continued. This time is different.

The current context combines a supply shock with an unprecedented demand drop and a global humanitarian crisis. Additionally, the advent of shale, excessive supply, and generous financial markets that overlooked the limited capital discipline have all contributed to poor returns. The Covid-19 crisis accelerates what was already shaping up to be one of the industry's most transformative moments.

To change the current paradigm, the industry will need to dig deep and tap its proud history of bold structural moves, innovation, and safe and profitable operations in the toughest conditions. The winners will be those that use this crisis to boldly reposition their portfolios and transform their operating models. Companies that don't will restructure or inevitably atrophy.

The Covid-19 crisis will accelerate permanent shifts in the industry's ecosystem

SHORT- & LONG-TERM SCENARIOS

Under most best-case scenarios, oil prices could recover in 2021 or 2022 to pre-crisis levels of $50-60 per barrel. In two other scenarios we modeled, those price levels might not be reached until 2024.

Regional gas prices could fall much lower than in the previous megacycle. Shale gas has unlocked abundant gas resources at breakeven costs less than $2.5-$3 per MMBtu.

Looking out beyond today's crisis toward the late 2030s, the macro-environment is set to become even more challenging. We expect growth in demand for hydrocarbons, particularly oil, to peak in the 2030s, and then begin a slow decline. Excess capacity in refining will be exposed, putting downward pressure on profits. In LNG, the expected and potential cyclical capacity expansion over the decade will add pressure and volatility to global LNG contract pricing, and hence to regional gas prices. In the long term (post-2035), gas will face the same pressures as oil with peak demand and incremental economics driving decision making.

Global gas and LNG will have a favorable role in the energy transition, ensuring a place in the future energy mix, supported by the continual demand growth in the coming decade. The innovation that has lowered costs for wind, solar, and batteries will continue and the decarbonisation will remain an imperative for the industry. Negative public sentiment and investor/lender pressure that the industry has endured in the past may turn out to be mild compared with the future. The energy transition and decarbonisation may even be accelerated by the current crisis.

The Covid-19 pandemic is first and foremost a humanitarian challenge. The current crisis will have a profound impact on the industry, both short and long term. How radically the oil and gas ecosystem will reconfigure, and when, will depend on potential supply–demand outcomes and the actions of other stakeholders, such as governments, regulators, and investors. In any scenario, however, we argue that the unprecedented crisis will be a catalytic moment and accelerate permanent shifts in the industry's ecosystem, with new future opportunities. We are likely to see an opportunity for a profound reset in many segments of the industry.

Upstream: A broad restructuring of several upstream basins will likely occur, underpinned by the opportunity created by balance-sheet weaknesses, particularly in US onshore and other high-cost mature basins. In the shale patch alone, we estimate that economies of skill and scale, coupled with new ways of working, could further reduce costs by up to $10 per barrel, lowering shale's breakeven point and improving supply resilience.

Downstream: Closing refineries and other assets with high costs or poor proximity to growing non-OECD markets was going to be necessary anyway, when oil demand begins a secular decline. Consolidation, another wave of efficiency efforts, and the hard work needed to wring out every last cent of value from optimising refineries and their supply chains is the likely industry response. In the medium term, the value of retail networks (and access to end customers) could increase.

Midstream: Well-located midstream assets supported by contracts with creditworthy counterparties have proven a successful business model. Midstream may well continue to be a value creating component of the oil and gas value chain, however, as demand peaks in the 2030s—there is likely to be downward pressure on rates driven by pipe-on-pipe competition.

Petrochemicals: Petrochemicals has been and could continue to be a bright spot in the portfolio for leading players. Disciplined investment in advantaged assets (such as at-scale integrated refining/petrochemical installations) that feature distinctive technologies and privileged markets should enable value creation.

Global gas and LNG: Gas is the fastest growing fossil fuel, with robust demand driven by the energy transition. However, the total extent of greenhouse-gas emissions is still being calculated for some LNG value chains. We estimate that global gas demand will peak in the late 2030s as electrification of heating and development of renewables may erode long-term demand. This, combined with midterm volatility, could lead to further consolidation and to an industry operating on incremental economics.

Oil-field services and equipment (OFSE) and supply chain: Much of the oil and gas supply industry was in a dire position coming into the crisis; significant over-capacity had emerged, and profitability collapsed after 2014. Restructuring may well happen now, with asset liquidation that resembles the 1980s oil bust more than the soft 2015–20 financial restructuring, and a new wave of business and supply-chain reconfiguration, technological acceleration, and partnership with customers.

National oil companies: NOCs will be under additional pressure due to their important role as contributors to national budgets and governments' societal needs. The difficult choices between industry supply discipline and market-share protection will accentuate. For NOCs not blessed with the lowest-cost resources, the pressure for fundamental change (for example, through privatisation or a rethinking of collaboration with IOCs and OFSE companies) will be intense.

LEARNING FROM OTHERS

It is instructive to seek inspiration from other industries that experienced sector-wide change, and how the leaders within these industries emerged as value creators.

Steel experienced both declining demand and stranded assets due to global shifts in demand that structurally destroyed value. However, a few players used different strategies to protect value. Mittal Steel built a model around acquiring assets with structural advantage (such as those in insulated markets, and some that allowed backward integration into advantaged raw-material supply) and then cutting costs and improving operations.

In automobile manufacturing, Fiat Chrysler Automobiles aggressively restructured its business model and culture by pursuing transformative mergers (Chrysler first, PSA Group lately) to gain scale in, or access to, preferred market segments, and to add global brands to its portfolio. It subsequently drove platform sharing across models and integrated supply-chain partners into its ecosystem.

In materials, 3M found a way to innovate on commodity materials that enabled it to identify high-value end markets.

In banking, JPMorgan Chase used its "fortress-like" balance sheet during the financial crisis to make attractive acquisitions and relentlessly pursue market leadership in segments it believed in.

Traditionally the super-major approach has been one model for value creation. Companies with scale, strong balance sheets, best-in-class integrated portfolios, advantaged assets, and superior operational abilities should create value even in a challenged future. Basin leadership has also long been a source of distinctiveness and value creation in oil and gas. Similarly, low-cost commodity suppliers with first-quartile assets have also thrived. Finally, the industry features some focused business models that create value through scale, capability and operational efficiency in specific segments.

THE RETURN OF STRATEGY AND BOLD ACTION

Many in the industry are thinking through how to lead their companies after the crisis and are posing existential questions about their reasons for being and basis for distinctiveness.

Will different forms of partnership with the supply chain be an important part of future business models? How should companies structure relationships with digital and advanced analytics companies to transform operations and to support new business models? Can technology and innovation unlock new growth for the industry: What would it take to deliver new LNG projects in a fundamentally different way at $300/ton and displace coal completely? Can the costs of CO2 mitigation be fundamentally lowered? In an era of abundance, will value flow to those that own the customer relationship and integrated value chains? Should companies make a radical shift toward renewables and away from oil and gas?

In answering these questions, companies should base their responses on three givens. The opportunity to lead has never been better; shaping regulation will matter, and enforcing operating standards will benefit industry and market leaders; and resilience and balance-sheet strength are nonnegotiable.

In our view, all companies should act boldly on five themes, consistent with their chosen strategy:

1. Reshape the portfolio, and radically reallocate capital to the highest-return opportunities: Companies should make tough and fundamental choices across the asset base and permanently reallocate capital away from lower-return businesses toward those best aligned with future value creation and sources of distinctiveness.

2. Take bold M&A moves: Winners will emerge with advantaged portfolios that will be resilient to longer-term trends. They should settle for nothing less than the absolutely best positioned assets in upstream, refining, marketing, and petrochemicals.

3. Unlock a step-change in performance and cost competitiveness through re-imagining the operating model: The Covid-19 crisis, which has forced companies to operate in new ways, may be a catalyst to rethink the size and role of the functional teams, field crews, and management processes needed to run an efficient oil and gas company.

4. Ensure supply-chain resilience through re-defining strategic partnership approaches: Leading operators will act now to ensure resilience by promoting new commercial and collaborative models to radically simplify standards, processes, and interfaces; lower costs; and increase the speed and quality of the entire system.

5. Create the organisation of the future, in both talent and structure: The oil and gas industry is no longer the premier employer of choice in many markets and is struggling to attract not only the best engineers but also the best new talent in areas such as digital, technology, and commercial. All are needed to drive business-model transformation. The root causes are partly perceptual, as many young people think the sector is placed on the wrong side of the transition. But another cause is the misalignment between the career-progression timeframes and work–life choices the industry offers and the expectations of newer generations of talent. The industry can learn from this crisis.

Industry fundamentals have changed and the rules of the next normal will be tough. But strong performers—with resilient portfolios, innovation, and superior operating models, potentially very different from today—can outperform. The time for visionary thinking and bold action is now.

OGN survey gives insights into strong challenges in industry

THE global Covid-19 pandemic has jolted the oil and gas industry, disrupting supply chains and choking off demand. And if that wasn't enough, the plummeting oil prices heightened the challenge for companies in the industry.

To understand the extent of the challenges faced by companies, *OGN* magazine conducted a survey in the GCC region across all sectors of the industry: upstream, midstream and downstream.

"Considering the significant role of oil and gas in the region's economies, the survey gives us an insight into the possible long-term impact on the industry, and compels companies to ask themselves hard questions and think strategically about how they will adapt as the pandemic and markets evolve," says Abdulaziz Khattak, Editor of *OGN*.

Of the survey's respondents, 57.2 per cent were small- and medium-sized companies and 28.6 per cent were large companies.

About 57.1 per cent said their business was moderately affected by the pandemic, while 28.6 per cent said the impact had been strong. Some 14.3 per cent also said they had not yet felt the full effect of the pandemic despite a visible slowdown.

The impact of the situation on the companies has been in many ways. Some 57.1 per cent said they had been affected due to a temporary shutdown, while others had been affected by employee absences due to sickness (28.6 per cent), clients not paying their bills (71.4 per cent), reduced logistics services (28.6 per cent), problems with infrastructure, such as internet or roads (28.6 per cent), increased administrative bottlenecks (28.6 per cent).

About 42.9 per cent companies expressed difficulty in importing materials or products from abroad, while 14.3 per cent said they were facing difficulty accessing inputs domestically.

Over half of the responding companies (57.1 per cent) said they were operating on reduced capacity, with 28.6 per cent saying their operations were normal and an equal number said they were operating remotely.

With regard to working ability, all the companies said they could work remotely. However, some companies added the inability to travel due to restriction were impacting sales and services, and customer interactions. Some also said their plants had to have people for operations.

To the critical question of whether their business was at the risk of permanently shutting down because of this crisis, 71.4 per cent were confident they would stay open. Only 14.3 per cent said they were at a risk of closing down in six months or more.

To further elaborate this, they were asked how long before the continued pandemic would force their business to close down, 28.6 per cent gave a timeframe of 3-6 months, an equal number said 6 months to a year, and 14.3 per cent said they would close down in less than 3 months if the pandemic continued.

The pandemic has had a huge impact on the workforce, with 42.9 per cent) saying their workforce numbers had changed due to Covid-19. About 28.6 per cent said they had laid off employees, while 42.9 per cent said they were temporarily reducing employment.

Other companies were also considering measures including reduction in its current workforce (57.1 per cent respondents), freeze on new employee hires (57.1 per cent), pay/salary freeze (14.3 per cent), and salary reduction (28.6 per cent). About 14.3 per cent said they were maintaining their current workforce numbers.

Other strategies followed by companies to cope with the crisis include remote working (85.7 per cent), online sales (57.1 per cent), increase in marketing efforts (28.6 per cent), reduction in marketing expenditure (14.3 per cent), and introducing customised/new products (14.3 per cent).

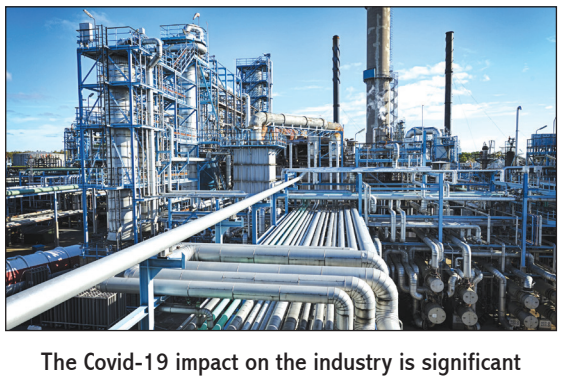
There was concern for maintaining financial performance for the current year. Some 71.5 per cent companies said the impact on their financial performance would be moderate, while 14.3 per cent anticipated a major impact.

A good sign, however, was the ability of companies (42.9 per cent) to maintain standing lines of credit to help them bridge this interruption in business. Yet 28.6 per cent said they had no financial cushion.

When asked what top three government measures would be most helpful to cope with the Covid-19 crisis, 57.1 per cent said rent subsidies, followed by employment programmes (such as temporary unemployment programmes), financial programmes (such as low interest credit line or credit guarantees), and tax waivers.

Among other challenges of the pandemic, companies pointed to keeping the morale of the workforce high and adjusting to the new normal topped the list. Yet others said there were financial challenges, and those of travel, sales and mental health of employees.

Some sales-oriented companies were concerned about the inability to have face-to-face meetings with customers. And others were worried about global trade.



The Covid-19 impact on the industry is significant

Chemical industry faces volatile backdrop on road to recovery

The coronavirus crisis may simply accelerate key macro trends already underway, creating a volatile backdrop for chemical companies to navigate on the road to recovery, writes Joseph Chang, Global Editor, ICIS Chemical Business

The chemical industry will have to meet public expectations of corporate social responsibility

FOUR key macro trends are shaping global discontentment: growing income inequality; the displacement of labour from automation, technology, immigration and free trade; wars displacing investment in infrastructure, healthcare and education; and increasing polarisation via social media.

Speaking at the American Chemistry Council (ACC) virtual annual meeting last month, Ian Bremmer, President of Global Political Risk Research and consulting firm Eurasia Group, said: "This is deeper than Trump. It is structural, as it's happening in so many countries. Politics is just symptomatic of that divide. You add the coronavirus, and it just accelerates these trends."

For example, technology can take away the ability of brick and mortar stores to turn a profit, even more so during the coronavirus crisis. And the clash between the US and China is progressing more rapidly because of the coronavirus.

In the US, the violent protests being sparked by the killing of George Floyd by police come amid a backdrop of a hyper-accelerated polarisation of political views, inequality, over 40 million unemployed Americans, and a major contraction in GDP, with the economic impact being experienced more by African Americans and other minorities, he pointed out.

"It should surprise nobody that we end up with much more violent protests with rioting and looting," said Bremmer.

However, the impact of the widespread protests on the chemical industry is likely to be limited.

"I don't see a great deal of economic impact [from the protests] on the chemical industry," said Peter Huntsman, CEO of Huntsman Corp, in an interview with ICIS amid the ACC virtual annual meeting.

"We need to bifurcate between the protesters and the rioters. I don't see how you can view the disturbing video of police brutality and not see a problem. We need to continue taking steps of progress," he added.

The chemical industry has a unique opportunity to attract people from the high school level to the STEM (science, technology, engineering and mathematics) disciplines, where they can have better job opportunities. In the US, many of its facilities are on the Gulf Coast and coastal southeast, which have more diverse populations, he said.

"In the hotel industry, it's hard to start from the ground floor and get to a six-figure salary in management. But working at a chemical plant, with trade technology skills, you can one day retire with $1m in savings," said Huntsman.

"These are great jobs, and we have to look towards better diversity in the workforce," he added.

Some of the root causes of the civil unrest include people under quasi-house arrest from the coronavirus lockdowns, and many people in service sectors losing their jobs, often after finding employment for the first time, he noted.

Add to that the degree of frustration around racial discrimination, and isolated cases of police brutality, and we're in today's situation, said the CEO.

US 2020 PRESIDENTIAL ELECTION

On the coming 2020 US presidential election, normally an incumbent president presiding over high double-digit unemployment, over 100,000 dead from the coronavirus, and a big decline in GDP would lose, Bremmer said.

However, President Trump's approval rating stands at around 42 per cent - the same as when there was record low unemployment, he pointed out.

"It's because the country is so incredibly divided. [Democratic candidate Joe] Biden has a broader base than Trump, but it is less enthusiastic," said Bremmer.

Another interesting wrinkle is that while Biden's base tends to be more scared of coronavirus, Trump has been all about getting people back to work. His base is more likely to show up at the polls, he noted.

In Eurasia's latest polls in US swing states - the ones that will matter in the coming election - Trump and Biden are within the margin of error.

"It's as close to a coin flip as you can possibly call it," said Bremmer.

"It will be a very interesting election. If you look at polling today, I'd give the popular vote to Biden and the electoral vote to Trump," said Huntsman.

"Enthusiasm is important. Who's going to go out in a rainstorm or the cold to actually vote? You don't see Democrats having that fervent enthusiasm for Biden just yet - it's been a lacklustre campaign," he added.

US-CHINA RELATIONSHIPS

If Trump's approval ratings slip into the 30 per cent range, there is a greater probability of Trump ramping up the rhetoric against China and using it as a cudgel in promoting the view that Biden is soft on China, he said.

"I do think we will head towards a more confrontational relationship with China," said Bremmer.

A cold war between the US and China would be another shift away from globalisation, ultimately leading to less efficiency, less growth and more volatility, he said.

While there will continue to be competition between the US and China, "long term, both are much stronger when working together than when squandering opportunities and working apart," said Huntsman.

However, he sees a "good probability" that the phase one US-China trade deal will be scrapped, or further progress delayed, as the impact of the coronavirus makes it difficult for China to meet its commitments in terms of substantially more imports from the US.

"In trade negotiations, the US needs to hold China's feet to the fire, but these relationships need to be built going forward. There will be dislocations around technology, pharmaceutical and medical. But when I hear talk of a cold war, it's silly and counterproductive," said Huntsman.

Huntsman Corp's supply chains are already largely localised, with about 95 per cent of sales in China from products produced in China or Southeast Asia, with the percentage in the low-90 per cent range for sales in Europe. It serves the US market from US production with some exports, he pointed out.

"We don't have large plants that export a lot. By and large we are close to the customer," said Huntsman.

ACC OVERHAUL

The chemical industry will also have to deal with changes in societal expectations, where the public and consumers have set a higher bar for corporate responsibility.

In this vein, the ACC plans to renew and refresh its flagship Responsible Care programme, focusing on health, safety and environment (HSE) in a rapidly changing political and social landscape.

"Responsible Care is about continuous improvement - not just for ACC member companies, but to the program itself," said Chris Jahn, CEO of the ACC, in the trade group's virtual annual meeting, noting that the last review of the programme was done in 2010.

In the past two years, there has been an increase in high profile accidents amid a changing regulatory and social landscape. Public expectations have set a higher bar, he noted.

"We will be asking hard questions. Responsible Care [is supposed to be the leading] environmental, health and safety programme. But is it?" asked Jahn.

"Responsible Care must be fresh, credible and valuable… Sustainability is a natural extension of Responsible Care and must drive performance and progress. Only then will perception improve," he added.

Mark Vergnano, CEO of Chemours and Chairman of the ACC board of directors, said the industry must have a forward-looking vision and do more than just commit to a renewed Responsible Care. There must be proven progress in HSE as a top priority.

"We must align around a single vision to meet a new political landscape and new expectations… We must not let the chaos of today distract from the opportunities of tomorrow," said Vergnano.

"Customers demand progress. Society demands sustainable solutions. Everyone wants world class technologies that solve problems without causing new ones," said Vergnano.

Details of the ACC's renewed Responsible Care initiative have yet to be released, but it's clear there will be a greater focus on sustainability and accountability to the public to reassure communities that the chemical industry is acting in its best interests.

"Commitment to sustainability cannot waver - no matter what's happening in the world around us," Vergnano said.

CRUDE OIL PRODUCTION, SELECTED GULF PRODUCERS

(1,000 bpd)	2018	2019	3Q19	4Q19	1Q20	Jan 20	Feb 20	Mar 20	Mar/Feb
Iran, I.R.	3,553	2,356	2,189	2,113	2,059	2,025	1,973	1,978	5
Iraq	4,550	4,678	4,752	4,633	4,560	4,570	4,504	4,165	-340
Kuwait	2,745	2,687	2,655	2,688	2,741	2,880	3,118	2,198	-921
Libya	951	1,097	1,103	1,163	348	91	82	82	-1
Nigeria	1,718	1,786	1,842	1,777	1,800	1,848	1,777	1,592	-185
Saudi Arabia	10,311	9,771	9,452	9,846	9,796	9,946	11,642	8,482	-3,160
UAE	2,986	3,094	3,096	3,135	3,208	3,507	3,841	2,477	-1,364
Total OPEC	**31,344**	**29,337**	**28,861**	**29,095**	**28,258**	**28,578**	**30,495**	**24,195**	**-6,300**

Global gas output to fall by 2.6 per cent in 2020

MANAMA: The Covid-19 pandemic has landed a lasting blow to both oil and gas markets. Global oil production has absorbed the lion's share of the impact, but natural gas output, which was previously set to grow, is also set to decline by 2.6 per cent this year, Rystad Energy forecasts. Production of associated gas from oil fields will be hit most, losing some 5.5 per cent compared to 2019 levels.

Before Covid-19 forced a new reality upon the energy world, Rystad Energy expected total natural gas production to rise to 4,233 billion cubic meters (Bcm) in 2020, from 4,069 Bcm last year. Now this estimate is revised down to 3,962 Bcm for this year, rising to 4,015 Bcm in 2021 and to 4,094 in 2022.

Production from natural gas fields, which was initially expected to rise to 3,687 Bcm this year is expected to reach 3,445 Bcm instead, recovering to 3,485 Bcm in 2021 and to 3,551 Bcm in 2022.

The most affected output in percentage terms is the one of associated gas, which was initially forecast to stay largely flat year-over-year from the 2019 level of 547 Bcm. It is now expected to fall to 517 Bcm instead in 2020, rising to 530 Bcm in 2021 and 542 Bcm in 2022.

"Part of the recovery will be driven by optimism in future oil prices, which could gradually drive output from associated gas fields to near 600 Bcm by 2025. But how future oil prices really evolve will actually define the total natural gas output," says Rystad Energy's Head of Gas and Power Markets Carlos Torres-Diaz.

The biggest drop in associated gas production will be felt in North America, which accounts for about half of the global output. From a level of 259 Bcm in 2019, associated gas output will fall to 246 Bcm in 2020 and remain flat in 2021. Only later will it start recovering, to 256 Bcm in 2022 and 269 Bcm in 2023.

The second-largest associated gas producing region, the Middle East, appears a bit more resilient. Output will fall from 95 Bcm in 2019 to 91 Bcm in 2020, quickly recovering to 94 Bcm in 2021 and 99 Bcm in 2022. Russia will see its associated gas production falling from the 2019 level of 52 Bcm to 46 Bcm in 2020, recovering to 50 Bcm in 2021, just marginally declining in years after that.

Europe's output, however, will keep its 2019's 38 Bcm levels flat into 2020, seeing an increase to 39 Bcm in 2021 and 2022, before peaking at 40 Bcm in 2023.

While global gas demand for 2020 has been revised down to 3,883 Bcm due to the impact of Covid-19, a jump in consumption during 2021 as a result of continued low prices and recovering economic performance could lead to a tighter balance. Currently, the production forecast for 2021 is 4,015 Bcm, meaning that if demand grows more than 3 per cent, the balance could tighten significantly. This would subsequently lead to higher prices, which could trigger a supply response.

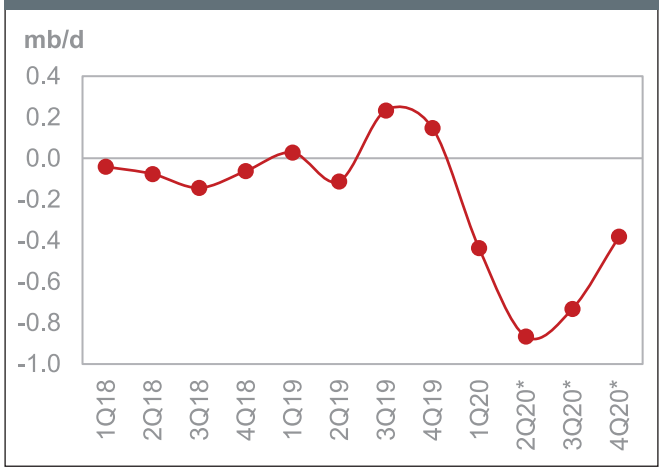
Rystad Energy current price forecast for 2021 suggests Henry Hub prices will average $2.7 per MMBtu and TTF prices $3.6 per MMBtu. The upside risk for global gas prices has increased as investments for projects are delayed.

WORLD OIL DEMAND FORECAST, MBPD *

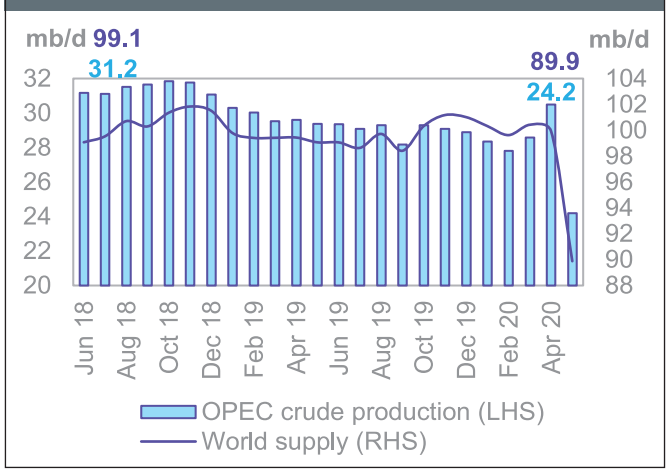
	2019	1Q20	2Q20	3Q20	4Q20	2020	Growth	Percent
Americas	25.62	24.47	18.95	24.48	25.16	23.28	-2.34	-9.13
Europe	14.34	12.95	9.67	13.25	13.68	12.40	-1.94	-13.53
Asia Pacific	7.96	7.88	6.25	6.64	7.40	7.04	-0.92	-11.51
Total OECD	47.91	45.30	34.87	44.37	46.25	42.71	-5.19	-10.84
Other Asia	13.86	13.15	12.20	12.40	13.66	12.85	-1.01	-7.29
of which India	4.84	4.74	3.90	3.94	4.83	4.35	-0.49	-10.07
Latin America	6.58	6.25	6.00	6.24	6.12	6.15	-0.43	-6.54
Middle East	8.20	7.81	7.01	7.93	7.62	7.59	-0.60	-7.36
Africa	4.43	4.41	4.25	4.05	4.20	4.23	-0.21	-4.67
Total DCs	33.08	31.62	29.46	30.62	31.60	30.83	-2.25	-6.81
FSU	4.84	4.50	3.88	4.45	4.61	4.36	-0.48	-9.97
Other Europe	0.76	0.71	0.54	0.47	0.56	0.57	-0.19	-25.22
China	13.07	10.27	12.55	12.37	13.28	12.12	-0.95	-7.29
Total "Other regions"	18.68	15.47	16.97	17.29	18.45	17.05	-1.63	-8.72
Total world	99.67	92.39	81.30	92.28	96.30	90.59	-9.07	-9.10

** Change 2020/19. Totals may not add up due to independent rounding.*

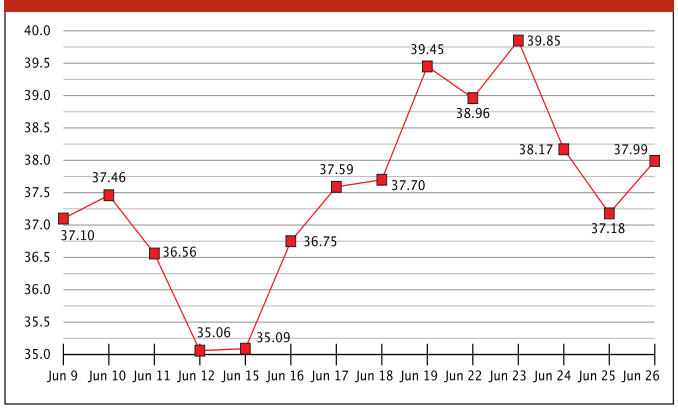
YEARLY OIL DEMAND GROWTH IN THE MID DLE EAST*



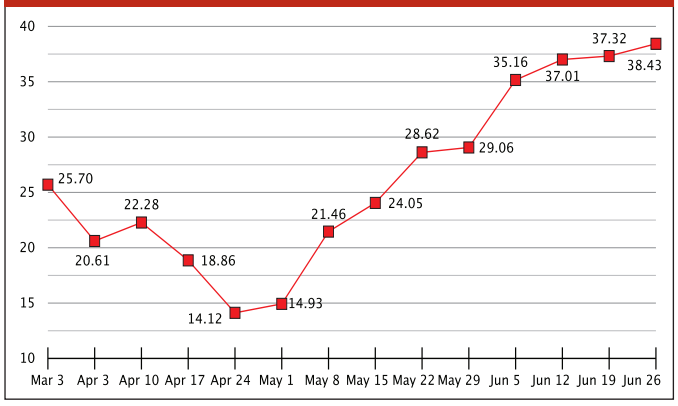
OPEC AND WORLD OIL SUPPLY*



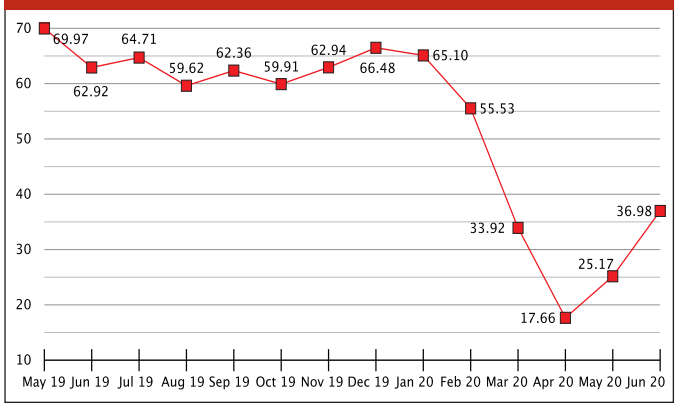
DAILY OPEC BASKET PRICE



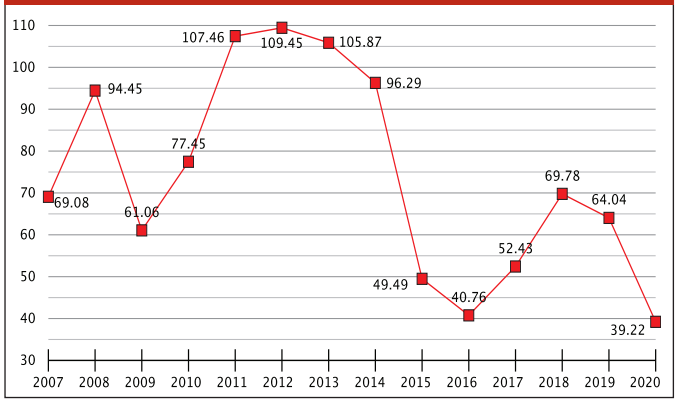
WEEKLY OPEC BASKET PRICE*



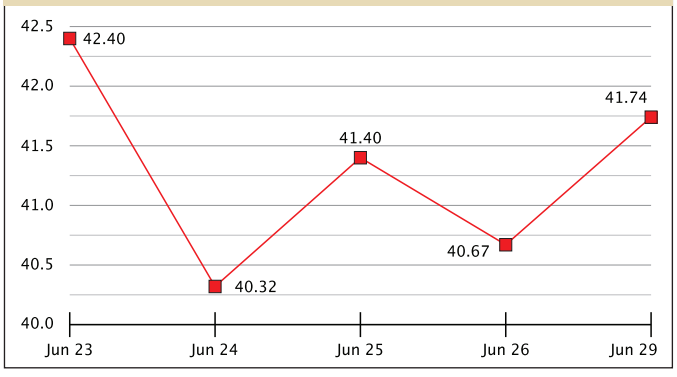
MONTHLY OPEC BASKET PRICE



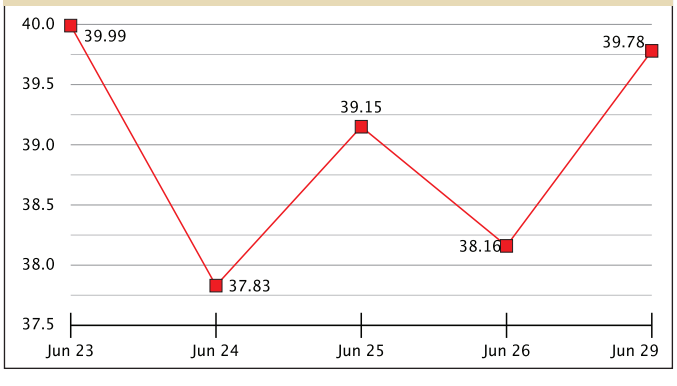
YEARLY OPEC BASKET PRICE*



IPE BRENT PRICES*



NYMEX PRICES*



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The energy industry's journal for the Middle East

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ISSN 0217-5541

Printed at Akhbar Al Khaleej, Kingdom of Bahrain

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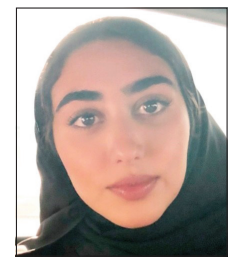
PEOPLE

Xylem strengthens regional footprint with new appointment in Middle East



XYLEM, a leading global water technology company committed to developing innovative solutions to the world's water challenges, has announced the appointment of Saudi national Al-Anoud Al Saud as Sales Engineer in its offices in Saudi Arabia, further strengthening its regional operations and underscoring its commitment to nurturing local talent in line with the Kingdom's National Transformation Program.

Joining a strong local team of Sales Engineers, Al-Anoud will be responsible for helping to drive a vibrant local supply chain, as part of the company's wider aim of improving water solutions locally. The announcement follows the recent appointment of five other experienced industry professionals in key offices across the UAE and KSA, as the company seeks to expand its footprint in the Kingdom, to better serve its growing portfolio of customers in Saudi Arabia and across the region.

Having garnered experience in the sector as a Quality Assurance Engineer in Riyadh, Al-Anoud brings a wealth of fresh talent and expertise to the role. A former student at Al Faisal University in Riyadh, where she graduated with a Bachelors degree in Industrial Engingeering, Al-Anoud was also recently recognised for her work at Al Faisal's prestigious 4th Engineering Design Expo & Competition

Two join Calgavin team

CALGAVIN, the heat transfer enhancement specialists, has announced two new appointments in the sales and marketing team: Tom Higley as Sales and Business Development Manager, and Alex Codreanu as Sales Proposals Manager. Higley joined in 2010 and has been promoted to his new position. His role will be to ensure successful business relationships are maintained with clients, find and nurture new companies for the company's whole range of products and services and facilitate new product developments .

GP Global team grows

GP Global has appointed six new highly experienced industry professionals in its key offices West of Suez, further reinforcing its growing bunkering capabilities worldwide.

Lars Doering has joined the group as Lead Bunker Trader; and Karsten Kurth, and Oliver Grunau as Senior Traders. Anthi Tsahilidou has also been appointed as Lead Bunker Trader, reporing to Chris Todd. Supporting her are newly appointed Senior Bunker Traders Alex Anagnostopoulos and Yiannis Vassilatos.

VIRTUAL EVENTS

7 July 2020
Topic: *Integrating Bifacial PV trackers and automated cleaning at extreme desert locations*
Website: https://atainsights.com/webinar-procuring-reliable-pv-trackers-for-extreme-weather-conditions/

Topic: *Digital Twins in Oil & Gas*
Weblink: https://www.oilandgasiq.com/events-digital-twins-in-oil-and-gas/

8 July 2020
Topic: *Emerging Opportunities for Energy Storage in the Iberian Peninsula*
Weblink: https://atainsights.com/webinar-emerging-opportunities-for-energy-storage-in-the-iberian-peninsula/

Webinar: *Optimize your bifacial PV tracker project to deliver extra energy gains*
Weblink: https://atainsights.com/webinar-optimize-your-bifacial-pv-tracker-project-to-deliver-extra-energy-gains/

9 July 2020
Webinar: *Save costs in your high temperature flow measurements*
Weblink: https://www.flexim.com/en/join-our-webinar-save-costs-your-high-temperature-flow-measurements

Event: *Energy Barometer 2020 launch webinar*
Weblink: https://www.energyinst.org/whats-on/search/events-and-training?meta_eventId=Barometer20

Webinar: *Grid Edge Solutions to accelerate renewable deployment in islands and remote communities*
Weblink: https://atainsights.com/webinar-grid-edge-solutions-to-accelerate-renewable-deployment-in-islands-and-remote-communities/

10 July 2020
Webinar: *Opportunities for Solar Heat in India*
Weblink: https://atainsights.com/webinar-opportunities-for-solar-heat-in-india/

15 July 2020
Webinar: *Tightening the belt: operational resilience during a challenging energy era*
Weblink: https://www.energyinst.org/whats-on/search/events-and-training?meta_eventId=62007A

Topic: *Proactive Planning and Customer Communications for the Next Pandemic*
Website: https://register.gotowebinar.com/register/1746561434222910224

Webinar: *Lowering LCOE with bifacial PV in Italy*
Weblink: https://atainsights.com/webinar-lowering-lcoe-with-bifacial-pv-in-italy/

22 July 2020
Webinar: *Energy Storage in the US: Building the financial business case for battery storage projects*
Weblink: https://atainsights.com/webinar-energy-storage-in-the-us-building-the-financial-business-case-for-battery-storage-projects/

CALENDAR OF EVENTS

SEPTEMBER 2020

1-3	World Heavy Oil Congress & Exhibition
Venue:	Oman Convention & Exhibition Centre, Muscat, Oman
Contact:	Raed El Forkh
Phone:	+971 50837 4721
Email:	raedelforkh@dmgevnts.com
Website:	https://www.worldheavyoilcongress.com/
13-14	Saudi Maritime Congress
Venue:	Dhahran Expo, Dammam, Saudi Arabia
Contact:	Antanina Severdiajeva
Phone:	+971 52 927 5767
Email:	antanina.severdiajeva@informa.com
Website:	https://www.seatrademaritimeevents.com smc/en/home.html
14- 16	Oman Petroleum & Energy Show (OPES)
Venue:	Oman Convention & Exhibition Centre, Muscat, Oman
Contact:	Satyam Chopra
Phone:	+968 24660124; +968 99344198
Email:	satyam.chopra@omanexpo.com
Website:	https://www.omanpetroleumandenergyshow.com
14-17	GEO - 14th Middle East Geosciences Conference and Exhibition
Venue:	Bahrain International Exhibition & Convention Centre, Bahrain
Contact:	Fawzi Al Shehabi
Phone:	+973 17 550033
Email:	fawzi.alshehabi@ubm.com
Website:	https://geo-expo.com/
29- 30	Asia Pacific Energy Assembly
Venue:	Raffles Convention Center, Singapore
Contact:	Ben West
Phone:	+65 6590 3978
Email:	benjamin.west@energycouncil.com
Website:	https://energycouncil.com/event-events/asia pacific-energy-assembly/

OCTOBER 2020

5-7	Gulf Constructon Expo, Gulf Property Show, Interiors
Venue:	Bahrain International Exhibition Centre
Phone:	+973 17299123
Email:	info@hilalce.com
Website:	http://www.gulfconstructionexpo.com, http://gulfpropertyshow.net/, http://www.interirosexpo.net/
6-8	OPEX Mena 2020
Venue:	Diplomat Radisson Blu, Bahrain
Phone:	+44 (0) 20 7357 8394
Email:	enquiries@europetro.com
Website:	https://europetro.com/week/opexmena2020
11-12	4th GPCA Responsible Care Conference
Venue:	Riyadh, Saudi Arabia
Contact:	Hector Aquino
Phone:	971144510666
Email:	hector@gpca.org.ae
Website:	https://gpcaresponsiblecare.com/
13-15	7th GPCA Research & Innovation Summit
Venue:	Riyadh, Saudi Arabia
Contact:	Hector Aquino
Phone:	971144510666
Email:	hector@gpca.org.ae
Website:	https://gpcaresponsiblecare.com/
21-22	North America Assembly & Dinner - Oil & Gas
Venue:	The Whitehall Houston, Houston, US
Contact:	Ryan Barry
Phone:	+27 21 001 3891
Email:	ryan.barry@oilcouncil.com
Website:	https://oilandgascouncil.com/event-events/north-america-assembly-and-dinner/

NOVEMBER 2020

9-12	Abu Dhabi International Petroleum Exhibition & Conference
Venue:	Abu Dhabi National Exhibition Center (Adnec), ABU DHABI
Phone:	+971 2 444 4909
Email:	adipec.enquiry@dmgevents.com
Website:	https://www.adipec.com/

PROJECT WATCH – QATAR*

Project	Facility	Budget	Status
Hamad International Airport - Expansion Works - Overview	Airport	18,000,000,000	Construction
Hamad International Airport - Expansion Works - Passenger Terminal Expansion	Airport	1,100,000,000	Construction
Al Sharq Crossing	Bridge	12,000,000,000	EPC ITB
Sabah Al Ahmad Corridor	Bridge	2,000,000,000	Construction
Special Economic Zone - Overview	Economic Zone	3,550,000,000	Construction
Qatar Barzan Gas Field Development Project - Overview	Gas Field Development	10,300,000,000	Construction
Qatar Barzan Gas Field Development Project - Offshore - Phase 3	Gas Field Development	300,000,000	On Hold
North Field Production Sustainability (NFPS) - Overview	Gas Processing	2,500,000,000	Construction
North Field Production Sustainability (NFPS) - Phase 1	Gas Processing	1,000,000,000	Construction
Dukhan Production Facilities Upgrade - Phase 1A - Overview	Gas Processing	260,000,000	EP
Zekreet Gasoline Production Facility - Phase 2	Gas Production	2,000,000,000	Shelved
Expansion of Gas To Liquids Plant	Gas to Liquids (GTL)	1,500,000,000	On Hold
Helium 3 Production Plant	Helium	600,000,000	Commissioning
Hamad International Airport Jet A1 Fuel Pipeline	Jet Fuel Pipeline	350,000,000	Commissioning
North Field Expansion Project - Offshore Facilities	Liquefied Natural Gas (LNG)	3,000,000,000	EP
North Field Expansion Project - Onshore Facilities - LNG	LNG Storage Tanks	2,000,000,000	EPC ITB
Doha Metro Network - Overview	Mass Transit Systems	37,000,000,000	Construction
Doha Metro Network - Green Line Extension Phase 1A	Mass Transit Systems	1,000,000,000	On Hold
Doha Metro Network - Red Line North Extension	Mass Transit Systems	1,000,000,000	On Hold
Special Economic Zone - Ras Bufontas	Mixed-Use Development	490,000,000	Construction
Expansion of Idd el-Shargi North Dome (ISND Phase-5) - Package 1	Offshore Platform	350,000,000	EP
New NFA Wellhead Platform WHP-3	Offshore Platform	200,000,000	Commissioning
NFB Offshore Living Quarters Accommodation Project	Offshore Platform	150,000,000	Construction
Al Shaheen Offshore Field Development Plan - Overview	Oil & Gas Field	800,000,000	Construction
Al Shaheen Offshore Field Development Plan - Phase 1 (Gallaf Phase 1)	Oil & Gas Field	300,000,000	Construction
Al Shaheen Offshore Field Development Plan - Phase 2 (Gallaf Phase 2)	Oil & Gas Field	300,000,000	EP
Expansion of Idd el-Shargi North Dome (ISND Phase-5) - Overview	Oil Field	780,000,000	EP
Expansion of Idd el-Shargi North Dome (ISND Phase-5) - Package 2	Oil Field	400,000,000	EPC ITB
Bul Hanine Redevelopment	Oil Field Development	11,000,000,000	Construction
Ethylene Complex	Petrochemical Plant	2,600,000,000	Shelved
Hamad Port - Phase 2 Overview	Port	1,350,440,000	Construction
GCC Railway Network / Long Distance Passenger and Freight Rail	Railway	15,400,000,000	On Hold
Doha Metro Network - Gold Line/Historic Line (Elevated / At Grade Section)	Railway	3,500,000,000	Commissioning
Doha Metro Network - Green Line/Education Line	Railway	3,000,000,000	Commissioning
Doha Metro Network - Blue Line/City Line	Railway	3,000,000,000	On Hold
Lusail Light Rail Transit Network	Railway	1,800,000,000	Construction
New Al Khor Expressway	Roads	2,100,000,000	Construction
Doha Expressway - Dukhan Highway (East Section)	Roads	1,100,000,000	Construction
Jeryan Nejaima Roads and Infrastructure Development	Roads	1,000,000,000	EP
Doha Expressway - Phase XII - Rayyan Package (Contract 2)	Roads	950,000,000	Construction
Doha South Sewage (DSS) Infrastructure Project	Sewerage Network	725,000,000	Construction

EP: Engineering & Procurement

**Sources: DMS Projects*

INDUSTRY NEWS

Bilfinger wins contract for bulk liquid storage

BILFINGER Tebodin Middle East has been awarded a contract in the UAE with Arabian Chemical Terminals (ACT) to do front end engineering design (FEED) and project management consultancy (PMC) Services for the development of a bulk liquid storage terminal in Khalifa Port near KIZAD, Abu Dhabi.

"The greenfield project is considered to be strategic for ACT as well as Khalifa Port and wider region including KIZAD and ZonesCorp since this will enhance the capabilities in handling and distribution of liquid bulk products and gases. The project will benefit existing customers and attract new customers in the region seeking liquid bulk storage and distribution and we are excited for Bilfinger Tebodin Middle East to be part of this," says Albert Vollema, Project Director of Bilfinger Tebodin Middle East.

"KIZAD is an integral part of Abu Dhabi's Economic Vision 2030 that holds a roadmap for suitable growth of the emirate's economy. We look forward to working with Bilfinger Tebodin Middle East as KIZAD is embarking to set new standards for industrial zone infrastructure, environment, and operations and we are certain of Bilfinger's expertise and knowledge to execute and deliver," says Kasper Castricum, General Manager at ACT Abu Dhabi.

Bilfinger is a leading international industrial services provider that enhances the efficiency of assets, ensures a high level of availability and reduces maintenance costs. It is primarily active in Europe, North America and the Middle East.

Bilfinger Middle East is a leading engineering and industrial services provider with over half a century of presence in the Middle East. With around 3,500 employees across the Middle East, it supports over 200 customers in the oil and gas, chemical and petrochemical, and energy and utilities industries of Egypt, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE.

QP – Bul Hanine Redevelopment*

Name of Client : Qatar Petroleum (QP)
Estimated Budget : $11,000,000,000
Facility Type : Oil Field Development
Sector : Oil Offshore
Status : Construction
Location : Bul Hanine
FEED : Worley
PMC : Qatar Petroleum (QP)
Main Contractor : cDermott International
Contract Value : $450,000,000

Background

QP will drill 150 wells through 2028 in the offshore Bul Hanine oil field. In production since 1972, the field lies 120 km off Qatar's east coast. The redevelopment is part of a comprehensive plan implemented to raise the efficiency of producing fields as well as implementation of various well-drilling programmes to increase crude oil reserves.

Project Status

In June 2020, construction works were ongoing as per the schedule.

Project Scope

The scope of the scheme includes new offshore central production facilities and a new onshore gas liquids processing facility at Mesaieed; drilling of 150 new wells between now and 2028. The new wells will be drilled from the existing/modified well-head jackets, as well as from 14 new wellhead jackets. Both new and modified wellhead jackets, in addition to associated production and injection flowlines, will form parts of the project works.

All wellheads stream fluids will be processed in the new offshore central complex, comprising production, compression, utility and living quarter platforms, with topsides weight ranging from 4,000 to 14,000 tonnes.

The produced oil will be sent to Halul Island for export, and the produced sour rich gas of about 900 million cu ft per day will travel via a new 150-km subsea pipeline to a new gas treatment facility in Mesaieed for products recovery. Lean sweet gas will be sent via a new subsea pipeline back to the new off-shore facilities for compression and injection.

The redevelopment project will replace some of Bul Hanine field's offshore facilities.

Project Finance

Qatar Petroleum (QP) is the client.

Project Schedules

Feasibility Study	2Q-2014
Award Date	Q4-2017
EPC ITB	1Q-2017
Engineering & Procurement	4Q-2017
Construction	4Q-2018
Completion	4Q-2022

INDEX OF ADVERTISERS

Adnoc signs $20bn energy assets deal

A consortium made up of the world's leading infrastructure investors and operators, sovereign wealth and pension funds will invest in select Adnoc gas pipeline assets

ABU DHABI: Abu Dhabi National Oil Company (Adnoc) has entered into an agreement with some of the world's leading infrastructure investors and operators, sovereign wealth and pension funds.

A consortium of investors comprising Global Infrastructure Partners (GIP); Brookfield Asset Management, Singapore's sovereign wealth fund GIC; Ontario Teachers' Pension Plan Board, Ontario Teachers; NH Investment & Securities and Snam, the Consortium; will invest in select Adnoc gas pipeline assets valued at $20.7 billion.

In one of the largest global energy infrastructure transactions, the consortium will collectively acquire a 49 per cent stake in Adnoc Gas Pipeline Assets, a newly formed subsidiary of Adnoc with lease rights to 38 pipelines covering a total of 982.3 km, while Adnoc will be holding a 51 per cent majority stake.

The innovative transaction structure allows Adnoc to tap new pools of global institutional investment capital, whilst maintaining full operating control over the assets included as part of the investment, said the statement from Adnoc.

Al Jaber ... milestone transaction

Under the terms of the agreement, Adnoc will lease its ownership interest in the assets to Adnoc Gas Pipelines for 20 years in return for a volume-based tariff subject to a floor and a cap. The transaction will result in upfront proceeds of over $10 billion to Adnoc and is subject to customary closing conditions and regulatory approvals.

The gas pipeline network connects Adnoc's upstream assets to local UAE off-takers. Ownership of the pipelines, management of pipeline operations, and all responsibility for associated operational and capital expenditures will remain with Adnoc.

For Adnoc's partners, this transaction represents a unique opportunity to invest in quality energy infrastructure assets with a low-risk profile that generate stable cash flows, said the statement.

This agreement is the largest transaction since Adnoc announced the expansion of its partnership and investment model in 2017, which aims to unlock value for Adnoc, it added.

On the deal, Dr Sultan bin Ahmad Sultan Al Jaber, Minister of State and Adnoc Group CEO, said: "This milestone transaction demonstrates the trust and confidence placed in Adnoc by the global investment community and unlocks significant value from our pipeline portfolio, following last year's groundbreaking oil pipeline infrastructure investment partnership."

"Today's landmark investment signals continued strong interest in Adnoc's low-risk, income-generating assets, and sets another benchmark for large-scale energy infrastructure investments in the UAE and the wider region," remarked Al Jaber.

IN BRIEF

Petrofac awarded project by Tatweer Petroleum

MANAMA: Petrofac, a leading a provider of oilfield services, said that its Engineering & Production Services division (EPS) has been awarded a multi-million dollar engineering, procurement, construction, and commissioning (EPCC) contract by Tatweer Petroleum for an upstream gas project in Bahrain.

Under the terms of the contract, the scope of work includes well hook-ups, associated pipelines, and tie-ins for several new gas wells that Tatweer Petroleum is planning to drill as part of its gas delivery strategy in the Bahrain field.

Mani Rajapathy, Managing Director, EPS East, said: "This award demonstrates continued confidence in our teams to deliver safe, timely, and efficient solutions for key projects in Bahrain. It leverages Petrofac's best-in-class expertise and experience in upstream gas. Tatweer Petroleum is an important customer in the region, and we look forward to continuing our relationship with them and furthering our commitment to building capability in the Kingdom."

Sewa completes 305-km natural gas network

SHARJAH: Sharjah Electricity and Water Authority (Sewa) has completed the implementation of a natural gas network in all areas of Rahmaniyah, with a length of 305 km, bringing the length of the network in the city of Sharjah to 1,750 km.

Sewa is currently working on implementing a strategic line from the Rahmaniyah station to the Muwailih commercial area with a length of 16 km, to serve the region and a number of areas and development projects, such as Al Waha, Nasma, Al Zahia and other new projects, reported state-run news agency Wam.

Sewa aims to deliver services to the people of the Rahmaniyah areas, and to take advantage of the natural gas pumping station. The services connects to 700 residential villas, and the rest of the buildings are underway, as the natural gas network has been started in the areas of Al Seyouh and the network will be implemented for developmental projects. The number of people who benefit from natural gas services in Sharjah exceeded 300,000.

Qatar Petroleum to integrate Muntajat

DOHA: Qatar Petroleum said it will integrate Qatar Chemical and Petrochemical Marketing and Distribution Company (Muntajat) into QP to strengthen its global competitive position in the downstream sector.

The integration will involve leveraging a combined set of human, technical, commercial, and financial capabilities, as well as customer relationships into the QP organization with the aim of being completed within the next few months, which will enable QP to continue expanding its global reach, and to remain the partner of choice providing superior high quality products and excellence in customer service.

Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President and CEO of Qatar Petroleum, said: "The integration of Muntajat into QP is a strategic move that will further strengthen our downstream capabilities and enhance the State of Qatar's global competitive position in the downstream sector.